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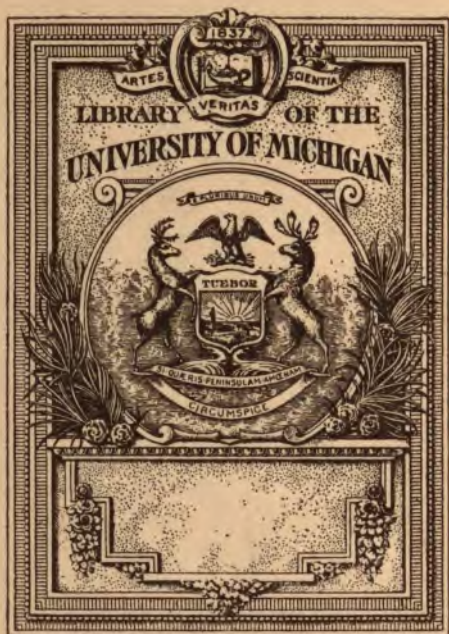
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A M... of
PHYSICAL TRAINING
FOR
BOYS AND GIRLS

BY
William G. Anderson
AND
William L. Anderson

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A MANUAL OF PHYSICAL TRAINING FOR BOYS AND GIRLS

*FOR USE BY PUBLIC-SCHOOL TEACHERS
PARENTS, AND THE SUPERINTENDENTS
OF JUNIOR SOCIETIES IN CHURCHES*

BY

Libert
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BOSTON AND CHICAGO
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HOW TO USE THIS BOOK

Most boys are intensely interested in competitive sports, and so are many girls. They will work to an unlimited extent for success in a game, but are not long zealous for class physical exercises or gymnasium drills. Here comes in the value of the simple sports treated in this book. They require little apparatus, if any. They can be practised effectively in solitude. And yet they may be given the zest of competition.

As an example of the way this may be done, take the plan suggested for Junior Christian Endeavor societies. Sashes are supplied for the members, — the officers, committees, and members wearing respectively sashes of three different colors. Brass badges are also provided, cut in the shapes of stars, crescents, and suns. These badges are to be worn on the sashes as they are earned by society work, including success in physical training. A star is given, according to a fixed schedule, for each feat or accomplishment. Five of the stars, when won, are exchanged for a crescent, and five of the crescents for a sun. Only one of each five stars may be gained by physical training; the rest must represent the spiritual side of the work.

The boy or girl will win a star by reaching the standard in any one of the feats described in this book — jumping, vaulting, shot-putting, etc. Each variation of a feat counts for a separate star; *i.e.*, climbing a pole and climbing a rope would be rated as separate feats.

Thus each pupil is competing with himself, striving to better his record; and at the same time he is competing with others, striving to win more credits and wear more honorable badges. An excellent feature is that all may win the very highest prizes in these contests. Another excellent feature is that the practising may go on at all times and in many places, at home and by himself, or in company with others and on the school playground.

The book, with some such method of using it, is to be commended with all heartiness to public-school teachers, the superintendents of Junior societies, parents, and the young athletes themselves. Written by high authorities, it cannot fail to inspire all that use it, and guide thousands of young lives into the ways of health and strength.

AMOS R. WELLS.

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MANUAL OF PHYSICAL TRAINING

I

FOREWORD

THIS book is not an argument for strengthening our belief in the efficiency of physical training; rather, it is a short manual which will guide us to some of the best methods of developing the boy and girl. We already have faith in gymnastics and athletics, in games and plays, in competitive sports; but, having nailed our flag to the mast, let us now stand by our guns and protect the boy and the girl by so developing them morally and physically that their own bodies, their own minds, and the ideals that impel them to every voluntary act of life will form a bulwark against the "slings and arrows" that will assail them throughout their lives. The boy and girl will never get along better by being neglected, they will certainly be well armored and forewarned if they are trained early.

Let me say a few words to the teacher or Junior superintendent, words that are selected after being a gymnast and athlete for forty-two

years and a teacher of boys and girls, young men and women, for thirty years of this time.

Action is life; inaction is death. There is no stopping-place; we are always on the journey in one or the other direction. If the boy and girl will not choose or cannot, let us do it for them. If they are unable to buy the chance to play, we must provide it.

Formal gymnastics are usually uninteresting, but play is the life of youth. The child that becomes greatly interested in competitive sports will, as James says, "knit on" the less attractive forms of development if he thinks they will be beneficial. The very kernel of the nut is to be found in this statement. Our oarsmen, football and baseball players, athletes and gymnasts, will daily for years undergo the drudgery exercises of the gymnasium as long as they hold the belief, which they do hold, that these "setting-up movements" are making them better members of their teams. The teacher, whether man or woman, must be in a number of ways an example for the pupil.

Here, again, I touch a sensitive spot. The person who preaches enthusiastically that cleanliness of body, the upright carriage, freedom from certain bad habits (such as smoking), consistent physical development, skill, ability to do or act, are most essential to health and efficiency, but is not himself careful of his own teeth or skin,

is careless about his standing position, carries the body poorly, smokes, takes no exercise, cannot perform the simple movements that he wants others to execute, and is not a good example, will find an obstacle in his way, not only at the outset, but all through his teaching. Remember that *you* are to be the MODEL; but *are* you?

You reply: "I am neither an athlete nor a gymnast: I cannot run or jump; I am too old to begin these things, and shall never be clever in competitive sports. I am careful of my personal appearance; I stand well; I sleep and eat well; and my body is both healthy and normal. I have enthusiasm; I love boys and girls; I have never forgotten my own boyhood days; I believe in right living; and I know that certain forms of physical activity constitute the bulwark of which you speak."

Let me say: "You are all right, because with this equipment you can do much. I know men who after fifty years of age have learned tricks in the gymnasium, have trained themselves safely to perform simple athletic feats, have acquainted themselves with the games young people like, have gone out to teach, and have succeeded because they have had that wonderful ability to 'impress themselves' upon their pupils."

A young woman, if in general normal health, can safely supervise the physical training of boys

and girls. She must use judgment, especially about the jumping and running exercises.

I am going to devote some space in this book to one of the most important things in the development of our pupils, regardless of their age, and that is the *standing position*. The men who act as our protectors on land and sea, our fighters, the soldiers and the sailors, are taught at the very outset to stand well. Why? Because the erect body is the normal body, and is likely to be the healthy body. There is nothing to be said against it, but much in its favor. It is the attainment that comes without apparatus or the gymnasium, without special exercises or costly appliances. It is most impressive as seen in the cases of George Washington and President Eliot of Harvard University; it calls for but a few minutes of daily training, and the only apparatus needed is the edge of a door.

Another gain devoutly to be sought is a good "chest," or, more accurately stated, a well-developed thorax. This is the abiding-place of the heart and lungs, vital machinery which starts to work when we are born and ceases the eternal tick-tick only when death stops them. A "deep, broad chest" — it characterized the hero of the book that fascinated our boyish days, and we envied him. The pupil's chest can be developed, and he can be taught to carry it beautifully,

without the use of any apparatus and without resorting to tiresome exercises.

A short chapter has been written on each of these subjects. I strongly urge the teacher first to try the methods himself and then to teach them to his pupils.

In all this work remember that from the character of a child's thinking, from the ideas he entertains, he will create his ideals; that play and games with attendant forms of exercise go far toward developing the right ideals, and that through them we can place the child on his feet so that he will be able to "play the game."

II

THE MORAL AND SPIRITUAL SIDE OF PHYSICAL TRAINING

THE object of any rational scheme of physical activity—gymnastics, athletics, and games—is to acquire health, better physique, grace, self-control, self-reliance, fortitude, courage, power of endurance, alertness of perception, quickness of action, a higher degree of co-ordination, muscular development, will power, right ideals.

We are likely to admit and pass over too quickly the moral side of physical training, and give our attention to other phases—one of which may be the exercises themselves—which are too often considered the end instead of the means. We should value physical education, or, for that matter, any form of education, for what it does, not for what is said of it.

In what way does physical education help the morals? In which of the two, gymnastics or athletics, do we find the ethical element to a greater degree, and what are our reasons for our decisions?

The object of life is a complete development of all the moral possibilities. These possibilities are sevenfold. Man is capable of development physically, æsthetically, intellectually, socially, politically, morally, and religiously. The person who neglects one or more of these sides of his nature is one-sided, and he who develops each one of these the nearest to its utmost possibility of development comes closest to attaining the object of life.

Gymnastics and athletics develop courage, prompt decision, self-control, judgment, self-reliance, and fortitude. The dangerous part of gymnastic work could not be done without these virtues, while the falls, slips, and slight accidents teach fortitude.

Football cannot be played by cowards. The rough usage that a young man receives on the field would soon cause him to withdraw if he lacks what is very essential in this popular game, namely, "sand," which is another name for "will." It is necessary only to examine the scarred bodies of our football players to know that they must bear pain like stoics. The game develops fortitude and courage, great self-control, quick judgment, prompt action, and endurance. In athletics we find the need for endurance, good judgment, and prompt action.

In all gymnastics and athletics, if we want the best results, we must obey the cardinal rule,

"Be good." The strict laws of training in gymnastics and athletics forbid every kind of vice. They demand the very best care of the body, which is looked upon as a clean, well-tempered instrument governed by a strong will. No form of immorality will be tolerated, while smoking, or even carrying a pipe in the mouth, is forbidden. At the training-table the choicest and most strengthening food is served. The conversation is of a healthful kind. Profanity is not allowed.

The athletes avoid company that will tempt them to violate these moral laws. They eat, sleep, and live by themselves. They admit by word and deed that their success depends upon their moral habits as much as upon the regular physical training. It is true that by some of the members of the crews, teams, and nines training is looked upon as a necessary evil; and in their cases there is often a relapse after the season is over; but this does not detract from the weight of the argument that to succeed in athletics one must lead a strictly moral life.

The *morale* of a team depends to a great extent upon the captain; but he is generally careful about the example he sets. One outside of college and preparatory school life knows little of the influence which the captain exerts over most undergraduates. They seek his society, and while with him obey the unwritten laws. Many

of the associates of athletes copy their ways of living; their habits and customs are discussed and imitated by boys in preparatory and secondary schools. It is true that the betting habit is an evil, but this is practised mostly by those not connected with athletics and gymnastics.

The consensus of opinion is that the moral tone of the athletes is above that of other undergraduates. A Yale man remarks that the habit of training required on the baseball field clung to him after leaving college, so that he was able to discontinue smoking by its aid. An Amherst man states that of the fourteen men on his victorious football team eight were of exceptionally high moral character. He also insists that the average moral character of Amherst athletes is above that of the other undergraduates of the same college. A Williams athlete makes a similar statement. Cowan, the famous Princeton football player, has made the statement that the backbone of their team was made up of moral men, while the reputation of Stagg, Williams, Heffelfinger, and others bears testimony to these statements. This is evidence from athletes themselves.

Our best amateur and professional gymnasts also bear witness to the truth of these statements. The professional gymnast is moral in many cases because morality is a means to an end, and that end is — cash. He has never

heard of the utilitarian or intuitional school of ethics, but nevertheless he does right because it brings him the greatest happiness, namely, a large salary. Consequently his living is right, because it brings him happiness, according to the "goods ethics." On the other hand, to do right because it is right is nothing to him, so that "duty ethics" would play no part in his life.

We have found that the young man who has trained his body by either athletics or gymnastics has a far greater control over himself, and is less liable to commit immoral acts than the one who has not. This is true also of the schoolboys. The boy who is trained in a gymnasium has greater strength of will to overcome evil habits than the one who has not been so trained. We therefore try to teach small boys, not only to care for their bodies, but to associate high ideals with health and strength. The immoral small boy is often so expert a prevaricator that he can deceive "the very elect." He will listen to advice, but the notes of warning fall on dull ears. This child can be helped in the gymnasium or on the field better and more quickly than in any other way. Bodily action is desirable in his case. Without a full, strong, natural action of the bodily functions, which is good for him morally and intellectually, both the moral nature and the mind are clogged. We cannot coerce a boy into being good, but we can sur-

round him with moral influences. Physical training does this. Health of body must tend to promote a healthful mind and heart.

"The character of a man is determined by his supreme choice." He has a strong physical character when he possesses great bodily strength, a strong moral character when he has the power of doing moral acts. What constitutes moral character? There are two elements: first, a strong will, or the power of decision; second, a man must desire and choose the good in preference to evil. Can we show that physical training develops the will, or that the choice of good is influenced by gymnastics and athletics? Professor James of Harvard says, "The will is the power which holds the idea prominently before the mind until it results in action," or, more simply stated, it is the power which commands action. This is shown in every feat of strength and skill in gymnastics, and there is little doubt in my mind that the will is developed and strengthened by physical training. Regarding the direction in which this force is exerted, it is known that the force may be exerted in either a moral or an immoral direction, and, although a man may be free to choose between good and evil, there are influences that have the power of determining his course of action. These influences are his own physical condition and his environment. A sound body tends to make

a man good-natured and philanthropic, while De Quincey's opium habit is a classical example of the desperate resorts to which dyspepsia can drive its victims.

Dr. Theodore T. Munger makes this statement: "When we think, it is not alone the mind that thinks; it is the whole man, and the process begins with the body. The bodily fibre or quality reaches to the thought. You will never get fine thought out of a coarse body. Nor less will you get sound thought out of an unsound body. The bodily condition strikes through, and shows itself in the quality of the thought. A vast amount of the poor, illogical, insipid, morbid, extravagant, pessimistic thought that finds its way into books and sermons and conversation has its origin in poor bodies and bad health. The body lies at the basis of success in all respects. A poor body means a poor life all the way up, even to the highest stages of spiritual life. Any religious experience that is connected with a weak or diseased body is to be regarded with suspicion. There can be no healthy thought, no normal feeling, no sound judgment, no vigorous action, except in connection with a sound body. Great minds are often shut up in poor bodies, as Pascal and Cowper, and Carlyle and Amiel; but in each case we make allowance for what is called the personal equation; their opinions are examined in the

light of their physical weakness and disease before they are trusted."

The testimony of President G. Stanley Hall also is valuable. He says: "I plead strongly for physical education on the grounds of good morals. I believe that the temptations that assail young people nowadays are to quite an extent those that would not overcome them if their muscles were strong. They are of that insidious, corroding, undermining kind that are somehow or other so prone to creep in as the contractile tissues become relaxed and habitually flabby."

Finally, then, physical education develops moral character, first, by lending its strength to the will; secondly, by directing this strength to moral channels through the influence of man's own physical nature, through his associates, and the purity of the scenes of his work. The minister of the gospel should know more of physical training when teaching ethics; the public-school teacher should know more of both physical training and ethics; while the teacher of gymnastics should know more of ethics.

"The laws of health are the laws of God, and are as binding as the Decalogue." — *Parker*.

"Get health, for sickness is a cannibal which eats up all the life and youth it can lay hold of, and so absorbs its own sons and daughters." — *Emerson*.

"At college I was taught the motions of the heavenly bodies, as if their keeping in their orbits depended upon my knowing them, while I was in profound ignorance of the laws of health of my own body. The rest of my life was, in consequence, one long battle with exhausted energies." — *Horace Mann*.

"Boys know well that games conduce not merely to the physical but to moral health — that in the ball-field boys acquire virtues that no books can give them, such as control of temper, self-restraint, fairness, honor, unenvious approbation of another's success, and all that give-and-take life which stands a man in such good stead when he goes forth into the world, and without which, indeed, success is always maimed and partial." — *Charles Kingsley*.

A more complete treatment of this subject will be found in "Anderson's Best Methods of Teaching Gymnastics," page 40.

III

HOW TO STAND WELL

THE erect posture is the normal pose of man alone; no other animal has this prerogative. It is therefore essential that we cultivate the vertical axis of the spine, insist upon our pupils' standing well, and teach exercises that will produce this result. Any deviation from the normal position will bring abnormal consequences, slight variations from the healthy condition of man.

The right idea of the standing position, coupled with will power, are essential factors needed in producing an erect posture. The gymnasium with its apparatus is unnecessary. Any one may, many times each day, assume and maintain an erect carriage. In a very few weeks the entire contour of the body will change, and the improvement is not only æsthetic but hygienic.

Should the reader wish to examine a careful work on the correct standing position, let him read "The Kinesiology of the Trunk, Shoulder, and Hip Applied to Gymnastics," by William

Skarstrom, M.D., of Columbia University, New York City.

A well-known orthopedic surgeon has popularized the "erect-posture idea" by stating that in a way the various organs of the body are supported on shelves when the body is rightly carried, but as soon as the body is bent or habitually inclined the organs slip from their supports, and bring additional work to other structures that are already burdened with their own duties.

Dr. Joel Goldthwait of Boston, in his paper read before the American Physical Education Association in Philadelphia, April 9, 1909, said:

"It should next be remembered that the pelvis represents the structural base of the body, that all of the trunk muscles are attached to it, that practically all of the thigh muscles are also attached to it, and that if for any reason the structural base is weak, the muscles that are attached to it, since they cannot act normally, must become weak. This means that it is useless to expect the muscles to regain their proper tone if the base to which they are attached is weak.

"Not only this, but it is unfair to expect that the body will be held in proper poise or used with normal freedom if the pelvis is weak, since the muscles cannot have their proper tone and the correct position must be difficult, if not impossible, to maintain. Not only is the proper

tone of the pelvic joints of importance in maintaining the poise of the body, but if for any reason the correct poise is impossible, it means that not only is the posture imperfect, but that the viscera will be less well supported and their function less perfectly carried on. If the body is erect, the abdominal viscera are held in place by the muscles and by certain anatomical supports which lose their effect when the body droops, and it is because of that that many of the displacements of the viscera take place.

"Not only is this true, but if for any reason the erect posture is impossible, the spinal muscles become still farther weakened as the result of the strain which must be thrown upon them, and with this weakening of the muscles about the spine the circulation in the spinal cord must also be interfered with — a fact which explains many of the nervous phenomena seen in such cases."

On this point Huxley says, in his "Physiology": "But man possesses certain special or distinctive anatomical characters. The most noticeable, as seen on an external inspection of his body, is his erect position. He is, indeed, the only living creature that can walk or stand erect, *i.e.*, with the axis of the spine vertical; with the hip and knee joints capable of being fully extended, so that the leg is brought into line with the thigh; with the foot so planted on the ground that it rests on the heel behind and

on the roots of the toes in front; with the upper limbs so arranged as to act not as instruments of progression, but of prehension; and with the



FIG. 1. A DIAGRAM ILLUSTRATING THE ATTACHMENTS OF SOME OF THE MOST IMPORTANT MUSCLES WHICH KEEP THE BODY IN THE ERECT POSTURE

I. The muscles of the calf. II. Those of the back of the thigh. III. Those of the spine. These tend to keep the body from falling forward.

I. The muscles of the front of the leg. 2. Those of the front of the thigh. 3. Those of the front of the abdomen. 4, 5. Those of the front of the neck. These tend to keep the body from falling backward. The arrows indicate the direction of action of the muscles, the foot being fixed. — From Huxley's "Physiology."

head so balanced on the top of the spine that the face and eyes look directly to the front. His bones, joints, and muscles are constructed and

arranged so as to enable him to preserve the erect attitude without fatigue. In other vertebrata the axis of the spine is oblique or horizontal; the hip and knee joints are permanently bent at a more or less acute angle; the limbs corresponding to the human upper extremities are, in the form of legs, wings, or fins, instruments of progression; and the head is articulated with the spine at or near the hinder end of the skull." (See Fig. 1.)

The foregoing may seem too technical, but it is written for those who are competent to teach others; it is not for the boy or the girl. A glance at the pictures in this chapter will give you a better idea of some of the variations in the standing position.

The following are simple rules for developing and maintaining the erect standing position.

Bring the heels and knees close together. If the conformation of the body prevents either, then bring them as close together as possible. Carry the hips well back and the chest forward. The shoulders should be level, the arms hanging naturally at the side but somewhat back.

The head should be erect, the chin slightly drawn in, and the eyes to the front or slightly raised.

The entire weight of the body should be well forward on the balls of the feet, not back on the heels. (See Fig. 5.)

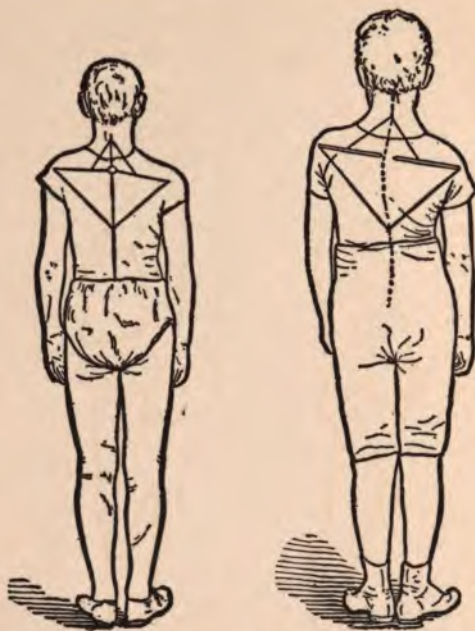


FIG. 2

FIG. 3

FIG. 2. DEFECT

Right shoulder lower than the left, caused by overdevelopment of the right side.

FIG. 3. SHOWS UNEVEN SHOULDERS AND A LATERAL CURVE IN THE SPINE

Caused by resting the weight of the body on one leg.

Press the back of the neck against the collar.
Do not tilt the head backward.

If a large looking-glass is available, stand be-

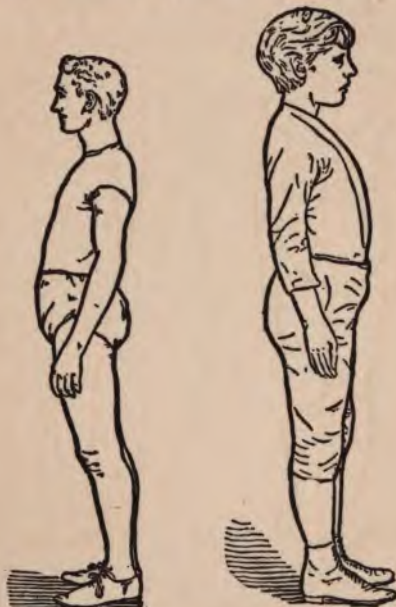


FIG. 4. PROJECTING HIPS

FIG. 5. SIDE VIEW OF A WELL-BUILT BOY

fore this in the above position several times a day for only sixty seconds at a time.

Stand against the edge of the door three times a day for only one minute at a time, assuming the position above outlined.

Place in your looking-glass or on your table a card or some special object which will remind you to stand well. When the object is no longer effective, change it.

Train yourself to *think* of standing well.



FIG. 6. DROOPING HEAD AND FLAT CHEST

Watch people on the street, and become a good but kind critic.

Be as strict with yourself as with others in your criticisms.

Write a short article on the subject. Secure

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a few photographs of men and women who stand well, and read this article to your pupils.

Show the pictures or have lantern slides made, and use them.

Preach the gospel of the erect carriage of the body.

IV

THE DEVELOPMENT OF THE CHEST

Too much attention cannot be given to the development of the "bony-cartilaginous cage that contains the heart and lungs." The widening and deepening of the "chest" is of vital importance, for here we find the never-ceasing pump and the machinery for the ventilation of the blood.

It was shown in the chapter on the standing position, page 18, that the *erector spinæ* group of muscles (back muscles) do much to maintain the erect posture. It is equally true that these same muscles are most active in arching the thorax and in raising the ribs.

This brief chapter presents the principles that should govern us in the selection of exercises to correct flat chest, funnel and pigeon breast, and other forms of thoracic asymmetry.

1. Arch the thorax by the contraction of the back muscles.

2. Elevate the ribs by raising the arms above the head. (Fig. 9.)

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3. Increase the capacity of the lungs by deep breathing and by active leg work, running, rope-skipping, etc.

4. Develop the heart by active leg work.

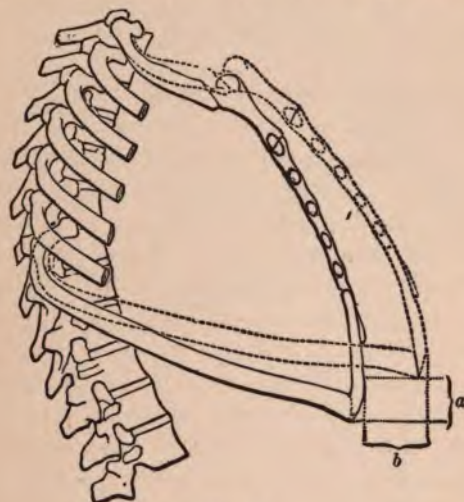


FIG. 7

Diagram of the displacement of the ribs and sternum in inspiration: *a* indicates the degree of upward movement; *b*, that of forward movement. (Testut. Gerrish.)

The above simple principles may be condensed into one general law, *i.e.*, to *widen and deepen the thorax, raise the ribs*.

Movements of the ribs and the thorax as a whole.
When breathing in, the thorax is enlarged in its

three diameters — transverse, through, and vertical. The increase in the vertical diameter is caused partly by the elevation of the upper ribs,



FIG. 8.
BEND POSITION,
ARMS BENT



FIG. 9.
STRETCH POSI-
TION, ARMS UP

and the resulting widening of the spaces between the ribs, but is mainly due to the action of the diaphragm. The increase in the other two directions is due to the movements of the ribs, which

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are greatest where the ribs are longest, most oblique, and most curved at their angles (*i. e.*, at the sixth, seventh, and eighth ribs opposite the bulkiest part of the lungs), and least in the short, flat first and second ribs.

The above change in the thoracic diameters is brought about by the movements seen in Figs. 8 and 9.

V

HOME TRAINING

IF, in addition to the class work and the competitive sports, the boy and girl will take exercises at home for developing different parts of the body, much will be gained. If the teacher notes that the pupil is especially weak in certain directions, he will call attention to it and suggest home exercises fitted to develop the pupil in those directions. For that purpose the following list will be of great service. The exercises suited to each boy or girl will be written on a card, which will be handed to him or her, with prescription of the number of times daily that the exercise is to be taken. Call for weekly report from each pupil as to his faithfulness in following out the prescription, and keep a record of each report.

DIRECTIONS FOR DEVELOPING THE VARIOUS PARTS OF THE BODY

Calf. — Practise rising on the toes. Running on tiptoe.
Hopping and jumping.

Front of Leg. — Bend the foot. Practise rising on the heels.
Walking rapidly.

Front of Thigh. — Raise and lower the body by bending the knees.

Back of Thigh. — Go through the motions of running, raising the heels high behind, without moving forward. Bending each leg as far as possible.

Back of Neck. — Clasp hands back of the head, and force the neck backward, keeping the chin in.

Front of Neck. — Clasp hands back of the head, and force the head forward by pulling with the hands.

Side of Neck. — Clasp the hands on one side of the head, and force the head to the other side. Reverse.

Shoulders. — Swing the arms sidewise. Swing the arms upward. Push the arms to a vertical position slowly and forcibly.

Hands and Fingers. — Hanging, climbing, etc. Open and close the hands.

Forearms. — Close the fist, bend the hand. Close the fist, extend the hand.

Upper Arm, Front. — Bend the elbows. Practise chinning. Climbing.

Upper Arm, Back. — Lying on the abdomen, hands on the floor, push the body upward by the arms. Pushing the arms upward from the shoulders.

Chest Muscles. — Swing the arms forward, downward, and across the body. Any motion drawing the arms to the front of the body.

Back. — Bending forward. Rowing.

Abdomen. — Lying on the back, practise raising the legs. Lying on the back and with the feet on the floor, raise the body to a sitting position. Hanging and climbing with the legs extended at right angles to the body.

Waist. — Hands on hips, bend the body to right and left. With feet separated and arms extended above the head, bend the body to right and left. Also practise turning the body from right to left.

Heart and Lungs. — Easy and regular running. Any rapid leg movement. Deep breathing. Raise the arms, and inhale. Lower the arms sidewise, and exhale.

VI

HABITS

THE purpose of this chapter is to give as briefly as possible the essential features of training the body for the performance of any athletic event. For special events separate hints will be given, to be used if possible under the guidance of an older person. Boys or girls should never attempt to do hard training without the advice and assistance of a thoroughly competent coach. It is the overworked, improperly conditioned boy or girl who injures his or her health, while the one who refrains from active training other than to build up his body in anticipation of the future never suffers from ill effects afterwards.

The principal object of training is to render the body capable of performing a given task with the least strain on the heart and lungs. Naturally the first thing to do is to improve the endurance, which is done by increasing muscular development, staying power or wind, and the regulation of habits.

There is no better way of increasing the muscle growth for special athletic feats than by daily

practice of them; but experience has proved that an all-around development will be of greater value in the long run than a one-sided development. It is therefore desirable that every boy or girl who wishes to become even a mediocre athlete should spend considerable time in building up the body in general, in order that he may have a surplus of strength suitable for any line of athletics.

Under the chapter, "Home Training," pages 28 and 29, exercises are given for the development of all of the body; and, even though the work may seem tiresome, remember that whoever wishes to become a successful athlete must learn to undergo hardship without complaint, and must discipline himself to months of apparently useless effort. No champion ever became such without years of self-denial and the hardest kind of work. By beginning early and creating a strong, robust body the pupil is not only increasing his power to resist fatigue, but is also developing will power that no school can ever impart.

Too often boys or girls will be found possessed of great muscular development and strength; yet, when called upon to run even a short distance, they are compelled to stop because of lack of wind. Such cases are more easily corrected than one in which the wind is good but the muscular ability poor. In the former case,

only a little practice is needed to increase the lung-capacity, while it requires time to increase the actual growth of the body. Running is the only desirable method of increasing respiratory strength. Deep breathing is advocated merely as an auxiliary. Too much deep breathing will create an abnormal condition of the lungs, which will defeat the purpose of the work.

Regulation of habits is a most important item. The time-worn adage, "Early to bed and early to rise," is nowhere more applicable than in athletic training. Regularity of hours means uniformity of sleep. No pupil can hope to do his or her best unless the amount of sleep obtained is uniform. The loss of rest is in direct opposition to nature's laws. A sleepy, tired boy or girl is no more in condition to give out his or her best efforts than is a sick child. It is not enough to get eight or nine hours' sleep out of each twenty-four, but at least two of the hours of sleeping should be before midnight, when the noises of the cities are lessened and the vitality of the body is lowered as a result of the day's work. Remaining in bed during the morning hours is a very bad habit in which the athletically inclined boy or girl should never indulge.

Regularity of meals and the nature of the diet are vastly important. Inasmuch as the activity of the body is dependent upon the character of the food eaten, it is evident that the small boy's

worst enemy is a "growing appetite." Right here we have the strongest argument against regular training by the young, although over-eating is productive of greater harm than under-eating.

It is poor policy to put "training-table" habits into the daily living of a growing boy or girl, for this is to place athletic training ahead of rational development. Any efforts towards restricting diet should be made only under the guidance of the physician or the watchful eye of the parents. The active child needs plenty of food, and should get it; but he or she should be discouraged from eating between meals, and the meals should be regular. Meats, with the exception of ham, pork, and veal, are easily digestible. Eggs, except when fried, are nutritive. Milk is injurious only in quantities. All green vegetables, rice, potatoes, and fruits, may also be eaten. Such luxuries as pies, hot cakes, doughnuts, and rich cakes should be eaten sparingly, if at all, during a training-season. Ice-cream, plain cake, custards, tapioca, rice, and bread pudding are safe desserts at all times. In a word, only those foods that are known to be easily digested should be taken. Eat slowly, and as much as desired, but at regular hours.

The importance of personal habits cannot be too strongly urged. Of all troubles that come to those who participate in athletics, that of

constipation is the most frequent. This is likely to be the result of neglecting to attend to the bowels regularly. It is a very simple matter to get into the habit of eliminating the body ashes at definitely appointed times, and the person who early acquires this habit will seldom find it necessary to resort to medicines.

Smoking hardly needs to be mentioned in this book; but all workers with children must impress upon those who are inclined toward the use of tobacco that it is a very active heart-depressant, and that the harms caused by it, such as nervousness, nausea, weakness, and digestive disturbances of various kinds, will do more to retard the boy's athletic ability than any other cause.

Profanity, the most unnecessary of bad habits, should never be heard on the athletic field or at the athletic quarters. The boy who is training his body to be clean must neither use oaths nor harbor thoughts of an immoral character. Moral weakness, which leads to loss of self-control, and in turn is shown by failure of the boy to do his best work, must be obliterated, and the youth who is strong enough to overcome this weakness will find in his after-life that the habits begun in his early career will make him a stronger man, physically, mentally, and morally.

The question of proper bathing is also important. Too much bathing is weakening, while

not enough is unhealthy. A bath a day, shortly after exercise and of short duration, will rarely prove harmful. Cold baths are not to be considered while the body's temperature is raised as a result of violent exercise; in fact, cold baths are seldom of value. Lukewarm water to remove impurities from the skin, using soap, and then a gradual change to colder water for only a few seconds, will rarely cause harm. If the body is lame or sore, the warm bath should be used. It is well to remember that a cold bath chills the system, a hot bath weakens, while a lukewarm bath of short duration neither chills nor weakens. Never bathe in a draught, nor within several hours after eating. A bath of ocean salt and water is often of benefit. Never bathe directly before a contest.

Rubbing is beneficial directly after bathing. Many lotions are used, especially in the case of lame muscles, etc. It is better not to use any of these except on prescription from a physician, as the mistake of applying a liniment or rub-down to a too sensitive skin has often led to serious results. Alcohol and witch-hazel are safe rubbing-fluids. Olive-oil is also good; but such powerful liniments as chloroform and Sloan's should never be used except by competent trainers. Never be rubbed too long or too hard. Rub the joints as well as the muscles, and always rub from the extremities toward the heart.

Lastly, acquire the habit of being cheerful. The cross, irritable pupil injures himself more than his playmates; and with good cheer the daily work will be less monotonous, the whole nervous and mental attitude will be more congenial, and the effects in after-life will be most advantageous.

VII

RUNNING

SPRINTS. — The word "sprint" is applied to all short-distance runs in which the full speed has been maintained throughout. Such runs may be of any length from 5 yards to 440 yards; beyond this the term "run" is used.

The sprints, especially the shorter ones, are the easiest runs; but the methods of training are by no means simple. A good sprinter must spend a long and patient period of preparation before he can acquire the "form" which is all-important in short distances. Time spent in attaining form, no matter whether the athlete is a long-distance or short-distance man, is well invested. A sprinter must practise distance running to gain endurance; and, vice versa, a long-distance runner must depend upon his sprint at the end of his race to carry him across the line a winner. Having gained endurance, which is the first step in all athletics, the rest of the time may be devoted to form.

Sprinting is to a certain extent a gift; and, though many of our young athletes try this form of exercise, the number of really first-class per-

formers is exceedingly small. Form plus brain will do wonders; but unless there is some inherent ability all the training in the world will not make him a first-class performer.

No set of rules has ever been published that is applicable to each case. Each individual has his peculiarities, and experience will prove that the suggestions which follow will need certain modifications to meet requirements.

In a work of this brief nature it is impossible to give every little point that might fit each peculiarity. The suggestions which follow are general, and are based upon the fundamental principles which are used by all successful trainers and coaches to-day.

The most important part of all sprint work is the "start," and all athletes should practise faithfully the best method of getting under way quickly. Many races have been won at the word "Go," simply because one man was more proficient at starting than the others.

In long-distance runs the method of starting is not of so great value as in sprints, though even here a good "get-away" will often be of help in gaining a desirable position.

The start is divided into four parts:

1. The preparation or "get-away."
2. "On your marks."
3. "Get set."
4. "Go."



FIG. 10. FINISH OF AN INTERNATIONAL SPRINT

Note how every muscle is used.



For experienced runners the pistol, of any calibre, is used instead of the word "Go"; but for the novice it is better to use two flat pieces of wood, or the voice, the main point being that the final signal should be as short and sharp as possible. To the inexperienced leader a word of caution is needed: Do not hold runners in the position of "get set" for a long time; and, on the other hand, do not send them away too rapidly. The position is a trying one, as the whole attention is centred on the next command, and the runner is likely to be over-eager; hence, if held too long, he will become nervous, the legs will tremble, the muscles will contract, and the whole body is strained and under a big disadvantage. If, however, the command is given too rapidly, the runner will anticipate, and "break" before the correct time. A simple rule to follow is to see that the runner is not anxious and that he is not moving before the signal.

The important factor in all starts is the taking of a position of ease and freedom from strain. The "crouch" or "standard" start is universally used, and is shown in the picture. The hands are placed directly on the starting-line, the width of the shoulders apart. The hands may be closed, with the weight resting on the knuckles; but it is better to spread the fingers, placing the thumb and first finger on the line, the other fingers being used to make a firm foundation.

The arms are held straight, as bending the arms lessens the spring, and hence causes a loss of time. The forward foot is then placed from six to nine inches behind a point half-way between the hands. Kneel on the knee of the other leg, placing the knee directly opposite the instep of the forward foot.

Holes may be marked and dug. It is of value to have holes from which to start. These holes are oblong, dug at right angles to the course of the runner. The front end may be slanting, but it is best to have the rear wall, from which the spring is taken, straight up and down, and the surface as hard as possible. These holes, from three to six inches in depth, are placed to correspond with the runner's correct position. The front hole is made first, and it adds somewhat to the comfort if the dirt removed is packed up on the sides of the rear knee, to be used as a cushion. The rear hole is dug at the point where the toes touch the ground. One should use care in preparing these holes, as a poor indentation will lead to a faulty start and perhaps lose the race.

Having the holes all ready, the next step is to prepare for the start.

First command: "Get on your marks."

At this command the runner takes the position just described, with his feet in the holes, the weight all on the front foot and knee.



FIG. 11. "GET SET"
Note the positions of the feet and hands.



FIG. 12. "Go"
This shows the drive from the foot, the arm-action, and the gradual rise.

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Second command: "Get set."

The runner now leans well forward, just enough not to lose his balance, with the weight all on the hands and the front foot. The rear foot is pressed against the ground just enough to steady the body, the hips are raised to a level with the shoulders, the back is straight or only slightly curved. The head is held up, and the eyes look straight ahead. Don't tremble or wobble; remain perfectly steady and alert. See the picture.

Third command: "Go."

The runner now pushes forward from his rear foot with all his force, adding just as rapidly as possible a similar drive from the front foot. See the picture. Don't try to push yourself erect with the hands.

The first few strides are short, and the body rises gradually to an erect position, which is gained after two or three strides; at the same time the stride is lengthened. The arms are bent at the elbow, and are swung forcibly forward and back from the shoulder-joint. Care should be taken to keep the body inclined slightly forward. Swing the arms diagonally and not straight forward. Don't twist the shoulders.

When once started in a race, never look back to see what your opponent is doing. A man running at full speed loses his balance very

easily, and a stumble may not only lose the race, but may cause physical damage that will require a long time to repair.

In training for the sprints the matter of body-position, variety of stride, pace, and innumerable other factors will come up. These can only be mentioned briefly.

The position of the body in any race should be a perfectly natural one; the arms should swing from the shoulders freely and in harmony with the leg-action. They will in all probability take care of themselves. The natural tendency is to have the opposite hand and foot forward; this keeps the body straight.

The body and head should remain erect, but it is better to lean slightly forward instead of backward.

Run on a "flat foot," both heel and toes touching the ground at the same time. Do not run on the toes; the amount of purchase obtained is too small. Run on the whole ball of the foot, learning to place your foot "straight," not "toeing out" or "toeing in."

Don't let the heels fly up behind. Such a step is a choppy one, and not a swing. Raising the heels too high behind delays the action. The object in the sprints is to get the foot back on the ground as soon as possible, and yet cover great distance. Practise "jogging" by lifting the knees well up in front and reaching out from the

knees. This will tend to eliminate the raising of the feet behind and also increase the length of stride.

The matter of pace is one of practice only. This can be secured by running known distances on time and thus learning how rapid a stride it requires to cover the distance in a certain time. Do not try to imitate another person's stride. It will not only prove disastrous, but also give a wrong idea of pace.

For those who are just beginning athletic work it is best to have some definite idea how to train for the short races. The principal thing is to go to work slowly. Begin by either taking long walks or indulging in short "cross-country runs," to build up the muscle tissue and increase endurance. When the body and legs are in good condition, the following schedule is suggested.

MONDAY. Warm up the legs and joints by jogging up and down, about 50 yards, once or twice. When doing this, practise raising the knees well up in front and bounding. Then practise starting, the first two or three times without command and slowly. Don't hurry. Next take about ten good starts, running only 15 or 20 yards on speed. Walk back to the starting-point; it rests one. Finish by running about 100 yards at half speed.

TUESDAY. Warm up the legs as before; this will dispel any stiffness left from Monday. Take

half a dozen starts, going about 30 yards once on speed. End by jogging a quarter of a mile.

WEDNESDAY. Continue the starts, taking about a dozen. Increase the trial of full speed to 50 yards. Rest awhile, then run about a hundred yards at half speed.

THURSDAY. Warm up as usual. Take the starts, run another 50 yards at half speed, and jog for a quarter of a mile.

FRIDAY. Take a few starts. Practise jogging for distances from 100 to 440 yards. Put in short sprints of 15 to 20 yards. Half an hour will be sufficient.

SATURDAY. Warm up. Try a hundred-yard run on speed. Get somebody to time you, if possible. Keep a record of this time for future comparison. End by jogging 220 yards at easy speed.

Keep to this schedule for the first three weeks. The second three weeks increase the speed slightly, continue the starts, and increase the jogging distance.

This is merely a guide, and the athlete must remember that as soon as fatigue appears the work must be modified. Experience will prove that each case is a separate one, and that "what is one boy's meat is another boy's poison."

Any suit may be worn, but the regulation knee running-trousers, light sleeveless shirt, and running-shoes is the most desirable. Canvas-



FIG. 14. OFF ON A CROSS-COUNTRY RUN
Notice the warm but comfortable suits.



covered rubber-soled shoes should never be worn without stockings. They blister the feet, and are usually so heavy that the exertion of carrying them around tires one as much as the running.

LONGER RUNS. — The question of the longer runs has no place in a book of this nature. For the youth under sixteen even to try the greater distances is a serious mistake. The demand made upon the heart and the nervous system is too severe, and no young boy or girl should attempt to make long runs unless directly under the care of an experienced and reliable trainer.

So tremendous an organization as the New York Public School League has disapproved of long races, and will not sanction runs of any nature that are likely to draw too heavily upon the vitality of the youth.

In England, a letter on the subject of Marathon running for boys was published recently by *The British Medical Journal*, the signers being such eminent authorities as Sir Lauder Brunton, Sir Thomas Barlow, Dr. Goodhart, Dr. Hale White, and Sir Albert Fripp, answering an inquiry by Mr. J. Herbert Farmer, an old football captain. It reads in part: "We have no hesitation in saying that we consider that school and cross-country races exceeding one mile in distance are wholly unsuitable for boys under the age of nineteen, as the continued strain

involved is apt to cause permanent injury to the heart and other organs."

The letter from which we have just quoted is a little too broad in its statements; but the fact remains that long-distance runs are not conducive to normal or healthy growth, and should be indulged in sparingly by all young boys. A boy in good health will not exert himself so strongly as a man, and his powers of recuperation are much more vigorous; but bodily strains are as easily acquired in youth as in manhood.

Therefore it seems that if an ounce of prevention is worth a pound of cure the only reasonable thing is to restrict the length of runs.

To eliminate all forms of cross-country running is to remove a very valuable training and development from the athletic education of youth. But they should be taught to run as a means of increasing physique and endurance, not for the sake of breaking records or winning races.

Dr. Frank Born, the medical examiner at the Yale gymnasium, says: "The value of athletics as an adjunct in promoting health cannot be overestimated, for in addition to giving the proper amount of exercise they bring one out-of-doors, an essential consideration in these days of indoor life. A thing of value, however, may become a positive evil. Such is often the

case with athletic sports in our grammar and preparatory schools, where over-enthusiasm, a national characteristic, is tending to abuse.

"I consider that the running by boys of the various track events from the quarter-mile up is entirely pernicious. This is not a biased opinion, but is founded on facts gathered from the examination of some thousands of college freshmen. The running of these distances tends to weaken the heart; for it must be remembered that this organ during the growth period may be sound, but not fully developed, and therefore any prolonged strain, repeatedly continued, may result in permanent weakness, a great handicap to an otherwise healthy boy. Furthermore, they drain the vitality at that period when everything should be conducive to its conservation, resulting in general physical weakness which may persist through life. To this one thing I attribute the fact that many schoolboy 'stars' fail to 'make good' in college."

On the other hand, many boys who are fond of athletics soon find that they are not built for the short fast races, but do evince a marked tendency toward endurance runs. For such cases there is no better form of exercise than the so-called cross-country races, paper-chase, or hare and hounds. These events might be considered as properly coming under the head of long-distance runs, but actually there is much

difference. Such races as the quarter-mile, half-mile, and mile are "hard sport" for the simple reason that there is strenuous competition, while cross-country work is more developmental. It is especially adapted to boys; the effect on the heart and lungs is beneficial, and leads to an endurance that will form a good basis for the training of later years.

The term "cross-country running" is self-explanatory. Road-running is of less value; but where the actual over-hill-and-down-dale kind cannot be taken, modified road-work will suffice.

All cross-country runs are planned in advance. Teachers and superintendents should see that they are not too hard or too far. By proper selection of the course it is possible to make the runs both interesting and amusing. A course of from half a mile to two miles is sufficiently long, the length being regulated by the ability of the boys.

Some boys will naturally prove faster than others. In such a case it is desirable to establish some method by which the slower boys can enjoy an equal chance of winning. The best means of doing this is to *handicap* the faster boys, giving the slower ones a few seconds' start, regulating the handicap by the ability of the fastest boy. By such a method the slower boys will have an equal chance of leading, and the faster boy will have to improve his speed.

In a series of such races the teacher will soon discover that certain of the slower boys steadily improve, so that the handicaps will have to be changed. A sliding system of handicaps can then be used, and thus each winner will be cut down on his allowance. This encourages the less likely, and adds stimulation to the more successful.

No regular training should be adopted, but it lies in the power of the teacher to show the boy how to run and how to increase his ability. The main point in cross-country running is to run freely. Do not let the boy strain or run with the body muscles tense. Let the pace be even from start to finish, and discourage the "sprints-and-lagging" system. Having once covered the course, the only thing a boy can do is to go over it daily, increasing his speed gradually.

SUGGESTION FOR A WEEK'S PRACTICE:

MONDAY. Run over the course so as to become thoroughly accustomed to it.

TUESDAY. Run over the first part of the course at an easy pace, then finish more rapidly.

WEDNESDAY. Run over the course, covering the first half at a fast pace; finish the remainder at the ordinary pace.

THURSDAY. Run over the first half of the course at an ordinary pace. Finish the last half at a fast pace.

FRIDAY. Run through the course at an ordinary pace.

SATURDAY. Cover the entire course at a fast pace.

HARE AND HOUNDS. — Hare and hounds or paper-chase is one of the most amusing of all the longer runs, and is of value because of its out-of-door nature. Any form of exercise that gives the boy an opportunity to be in the fresh air is, provided it is not too severe, beneficial and conducive to better development and physique.

This event is not rightfully classed as a competitive sport, for the reason that it is more on the order of "follow the leader," while there is just enough rivalry to prevent the interest from lagging.

If the course is properly selected, two good hares can give the hounds a most exciting chase by putting a great variety of obstacles in the way of the pursuers. While the hares must go over the route in order to lay a trail, the hounds, of course, will have no more to do than the hares.

The laying of false trails is allowable, but it must be done by both hares; no separation is permitted, and the false trails must be retraced. By doubling in this manner the hares can add considerable confusion for the hounds.

The teacher may select two boys as the first hares, and have a paper-cutting contest to decide

upon the leaders. A simple and advantageous method is to give each boy an equal amount of paper (an ordinary daily newspaper will do), explain that the paper is to be cut or torn into small pieces, about an inch square, and the boy who cuts the largest quantity in a given time is to be the first hare; the boy cutting the next larger amount being the second hare, and the third boy being the alternate. A scheme of this kind serves two purposes: it not only gives each boy a chance to be a hare, but it also supplies the paper, of which a large quantity is needed.

The hares now being selected, let them collect all the cut or torn paper and divide it between them. Supply each of them with a bag about twelve inches square, made of cloth (canvas is best because of its strength), the bag having a long strap so that it may be supported by the shoulders and leave the hands free to scatter the paper.

The next thing is to select a course. It is desirable that in the first selection the teacher be consulted. Let the hares choose any course, but care should be taken that it is not too long or difficult, as the popularity of the following chases depends upon the success of the first attempt. The course selected must be kept a secret by the hares; otherwise the whole affair would be a farce.

Having the course selected and the time set,

the hounds are gathered together for instructions. The hares with the bags of paper are given a start of from three to five minutes, depending upon the length of the race, but the hounds are not to see which direction they take. After two minutes, or within a radius of three hundred yards, the hares begin to drop the paper, only one hare dropping at a time and at intervals of at least thirty feet, a small, unbroken trail of paper being too easy to follow.

At the end of the three minutes the hounds are liberated. They must first locate the starting-place of the trail; and, when this is discovered and the signal is given, all start out in pursuit. As soon as the hares have scattered all the paper, the bags are either hung up or left as part of the trail; and the hares start home at once. As soon as the hounds have discovered the bags, the real race begins, as the boys who reach the original starting-point first will win, and they should be the hares for the next race. If during the race the hounds should overtake the hares, the bags are handed over to the hounds, and the race for home is started. The hounds need not follow a trail if the hares are in sight, and on the way home they need not follow any regular course. The hounds are winners if they get home before the hares, at the same time, or within the time (three to five minutes) allowed the hares at the start.

Races such as described should not be more than twenty or thirty minutes in duration, as a long run out means a long run home; and the hares should see that the place at which they drop the bag is fairly near the starting-place. By running in a wide circle this can easily be accomplished.

RELAY RACES. — Relay or team races are the most exciting and interesting of all the races. Inasmuch as a race of this nature gives a greater number of boys a chance to run, it becomes of distinctive value, for the real object of any sport is to interest the largest number, and not to concentrate on a few. Then, too, it has the element of personal rivalry, which tends towards the development of rapid thinking, and combines the keen, active interest of athletics without specialization.

The actual distance of such races is a matter of choice, depending entirely upon the number of boys the teacher desires to have run. The distance for each runner should not be more than one hundred yards for boys, or fifty yards for girls and for small boys (under thirteen years). If the sides are large, the course may be run over twice, although these matters may be left to the judgment of the teacher.

A single example will show how to conduct races of this nature. Two boys are selected

as captains. Each boy chooses, by any method desirable, two, six, or eight boys, depending upon the number available. Then two lines are drawn, about fifty yards apart; but this is optional, as the available space will decide the limits of the race. Next, the boys of each team, standing on the first line, are numbered. All the odd numbers of both teams line up, those of each team in a row, the two rows well separated. On the second line the even numbers are similarly placed, those of the two teams lining up in separate rows and not too close. At the word "Go" both number ones race to the line opposite and touch the hands of the number twos, who stand with arms extended ready to run as soon as touched. The number twos, in turn, "touch off" the number threes, and so on until all the boys have been touched. The side wins whose last man, being properly touched, crosses the finish line first.

Care should be taken to see that each runner touches the succeeding runner, and that no boy leaves his line before being touched. To eliminate any failure to touch it is best to have a small flag or handkerchief which must be handed to the boy next to run, thus ensuring a touch, as a failure to grasp the article used would necessarily delay and therefore handicap the side at fault.

In case it should be advisable to handicap



FIG. 15. TOUCHING IN THE RELAY RACE
Some runners have already started, while others are waiting to be touched.



either side, all the lead should be given the first man, in order to keep the distances for the remaining men regular and do away with any confusion that might arise.

It will be seen at once that in such a race a leader can use considerable strategy in placing his men, and experience will soon prove that it is of distinct advantage to have fast runners for first and last men.

POTATO RACE. — For this race the essential needs are potatoes, apples, stones, or any article that is small and easily carried; a basket for each competitor, to be used as a receptacle; and a fairly level ground space. As many as desirable may take part, though it becomes harder for the teacher to judge the winner if too many are running at once.

A starting-line is drawn, and the receptacle is placed at this line. These receptacles should be of uniform size, the regulation size being thirty-six inches in circumference. Directly in front of the basket and at a distance of two yards apart are placed three or more potatoes. Five is sufficient, as this makes an actual distance of sixty-five yards which each runner must cover. Another line is now drawn, five yards away from and behind the starting-line; this line must be crossed after the competitor has deposited the last potato in the basket. Each

runner starts from directly beside his basket. The potatoes may be picked up in any order. The object is to pick up one potato at a time, and to drop it, not throw it, into the basket. The one who successfully deposits every potato in the basket and crosses the finish line first, wins.

If a competitor drops a potato, he must pick it up and place it in the receptacle before he touches another potato; otherwise he is disqualified.

THREE-LEGGED RACE. — For this race partners are chosen and tied together. The inside ankles of the two are fastened together by a strap or two handkerchiefs, leaving enough leeway (about three inches) so that the runners will not step on each other's feet. Another strap is used to fasten the legs in a similar manner, anywhere between the knee and the hips. The upper fastening should be tight enough to prevent its falling down. The inside arms of the partners are placed around each other's waists, and a good hold is obtained.

By practice two boys can readily learn to make very fast time, but in learning they should begin by walking together and gradually increasing to a run. By keeping close to each other and running in a perfectly natural way the boys soon acquire perfect unison and a corresponding confidence. Care should be taken not to slow up too



FIG. 16. THREE-LEGGED RACE
Showing the method of fastening the legs.

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rapidly, as a break of any kind will mean a tumble and a race lost.

SACK-RACE. — This is an amusing though difficult race. You need large sacks, and clean crocker-sacks will do, though regular sacks may



FIG. 17. SACK-RACING

readily be purchased from a dealer in athletic goods. The sack is tied around the waist, or preferably around the neck, thus preventing the use of the arms and legs. It is impossible to run in these sacks, and the only method of progression is by hopping. The maxim, "Practice makes perfect," has no truth in sack-racing, and the results will always be amusing to both spectators and competitors.

OBSTACLE-RACE. — This form of exercise is seldom used in competition, though for boys

and girls it is extremely useful as a novelty. The course consists of any series of obstacles, over which or under which the runner must travel. Teachers with a little originality can readily make such a race very humorous by having the runners go through all manner of "stunts," and there is no law to prevent making it educational as well as recreative.

VIII

JUMPING

IN the chapter on running the term "form" was frequently used. When one begins training for the jumps, he should have as his motto the same word. Accuracy and precision of movement are the prime factors in all forms of jumping. These two essentials are gained only after months of careful and scientific practice. The right beginning means everything; a fault at the outset may handicap an athlete for years, and lead to difficulties that only a great amount of correction can overcome. "Make haste slowly"; master the fundamentals; be patient; start right: these are the prime requisites for success.

Every jumper, through peculiarity either of build or of temperament, presents some point of difference from his fellows, so that no one standard for jumping can be given for all conditions. Each athlete must be handled according to his capability, and trained accordingly. General rules are all that can be given here; but, if followed, they will at least demonstrate

whether a boy or girl has natural ability, and will serve as a basis for training.

Jumping, high jumping in particular, is one of the most valuable forms of exercise. It calls for co-ordination of movement, ease and grace of action, courage, quickness of judgment, and perseverance. These mental and physical characteristics are of inestimable worth, no matter whether the pupil becomes an expert or not.

Too often young pupils will follow the course of least resistance, and look upon the drudgery of practice as not worth while. This attitude is all wrong, and the teacher should urge upon his pupils the truth that success comes only from repetition and experience.

There are several distinct forms of jumping in use to-day, but they are all related to the style which was first brought into prominence by Mr. M. Sweeney, when he jumped the wonderful height of 6 feet, $5\frac{5}{8}$ inches. By following his method, the pupil may be sure he is working along the right lines.

The most natural style of jump is that in which the pupil approaches the bar from the side, throws one leg up and over, and then lifts the other after it. This method of jumping is obsolete, or should be, as by it the jumper can reach a certain height and then go no further. It is also more or less dangerous, as in striving to get higher the body will be overbalanced, and



FIG. 18. CLEARING THE BAR

Note how the arms are thrown up to keep from knocking off the bar.



FIG. 19. STARTING THE TURN

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the jumper is liable to injury by falling on his back. In the modern jump the body is so controlled that the athlete invariably lands feet first.

The greatest difficulty beginners experience is their inability to get a correct "take-off"; that is, to determine the right point from which to jump in order to assure the best results. Practice will demonstrate where this is, but a simple method of approximating the correct "take-off" is to stand directly in front of the bar and just far enough away so that, when you lift either leg straight up in front, waist-high, it will barely miss the cross-bar. This will quite accurately indicate the right distance for the "take-off." Mark the spot so that it can be plainly seen.

Now pace off about six or eight paces from this mark, and make a second mark. Standing on this mark, either foot forward, run toward the first mark. By studying the number and the length of strides necessary to bring him exactly to this "take-off," the athlete can easily measure a correct distance that will, if he starts from the mark with the correct foot, always bring his "take-off" at the right point. As the bar is raised, it may be necessary to move the "take-off" back, but for boys this is not at all important.

The "take-off" having been settled, the attention is next centred upon the actual jump.

Begin by running straight at the bar. Do not run fast, but bound along easily, gathering just enough speed as the bar is approached to carry the body over. Too much rapidity will carry the body directly into the bar, as there will not be enough time to lift the body the required height.

With the jumping foot on the "take-off," the off or free leg is swung powerfully upward with a slight oblique motion, the toe pointing upward and to the side of the jumping foot; the arms also are swung upward and forward. The jumping foot is then brought up, with knee bent, and swung over the bar in front of the off leg with the heel very close to the thigh. Once over the bar, the legs are shot downward, the arms are reached forward; and, with a quick twisting of the head and shoulders, the head is turned so that the landing will be easy and free from strain.

The body is never upright when crossing the bar; instead, it is always leaning backward as if the jumper were lying down in the air. The twist of the shoulders and the body should turn the jumper in toward the bar, so that the front of the body is facing the bar when the feet hit the ground. If the side or back is facing the bar when the body is directly over the stick, it can easily be seen that a considerable amount of energy is required to complete a jump and



FIG. 19. STARTING THE TURN



allow the athlete to land in a position free from jar.

HIGH JUMP. — Spring and liveliness are two absolute essentials for high jumping, and both can to a certain degree be acquired by practice. The jump itself should be made with the utmost care. Too much work will overtax the muscles, and render them liable to strain and perhaps injury.

It is a good plan to jump only when in the mood; at other times a change in the form or character of exercise will be of equal value, and a welcome break in the routine. For the beginner it is always a wise plan to select exercises that tend to develop the body as a whole. High jumping, *per se*, does not consist alone of the actual leg-work; but almost all of the larger muscles in the body have their share of action.

To this end of broad development, an athlete should begin by rising on his toes only a few times at first, but will gradually increase the number until it reaches fifty. Then practise lifting up the knees, or bending them; also do some high kicking. These movements build up the leg-muscles and keep them in condition. The work for the body, such as bending forward and backward, and twisting, will be of value because of the strain that jumping brings on the spinal muscles.

The daily work should be for form almost entirely. Placing the bar at an easy jumping-height, one can practise the take-off, the leg and arm action, the body-twist, and the landing, while he can also have a chance to develop the ease with which a jump should be made. While trying to clear easy heights with less and less exertion, the jumper will rapidly gain confidence and form; then, when the bar is raised, the exertion will not be so great.

Never practise for extreme height more than three times a week. Five days' jumping out of seven is enough to keep the athlete in condition. When jumping for height, do not raise the bar too rapidly, and do not try each height more than once. Ten or twelve really hard attempts a day is as much as any young boy should make. Extended daily training will soon use up the vitality, and the boy will lose the spring and ginger that he needs for his best efforts.

Never, if it is possible to prevent it, let a high jumper take up such events as broad jumping or hurdle-racing. The one is an effort for height alone, the other for speed and distance, and they will very soon upset the whole idea of the high jump.

In the high jump it is imperative that the jumping-conditions be correct. If this work is indoors, care should be taken to see that there are plenty of mats to land on, and that the floor

at the take-off is not slippery. Rubber shoes should be worn for all indoor jumping. If the jumping is done out-of-doors, the landing-place should be very soft and free from stones or lumps, and the earth should be turned up or sawdust piled thick. The ground around the take-off should be firm and level, and the shoes should be either rubber-soled or the regulation jumping-shoes.

The bar should be a thin stick two inches in width, and should rest on pins which project not more than three inches from the uprights. If this bar is knocked off in the jump, it constitutes a trial jump without result.

The height at which the jump shall commence, and the height to which the bar shall be raised at each succeeding jump, shall be decided by the field judges.

The height of the jump is to be measured from the middle of the bar to the ground on a direct line.

Each competitor is allowed three trial jumps at each height; and, if on the third trial he fails, he shall be declared out of the competition.

At each successive height each competitor shall take one trial in his proper turn; then those failing, if any, shall have their second trial in a like order, after which those that have failed at the second trial may take their third and final trial at that height.

A competitor may decline to jump at any height when his turn comes, and by so doing he forfeits his right to jump at the height declined throughout the test. If, however, a competitor takes a trial at any height, and fails in the first trial, he is not to omit the other two trials.

Running under the bar in making an attempt to jump is counted as a balk, and three successive balks constitute a trial jump.

There is no limit to a run a competitor may take before attempting a jump.

In case the two-inch stick for a cross-bar is not obtainable, an ordinary bamboo fishing-pole will be found satisfactory, and for daily practice much more desirable, as it does not bark the shins, and will not break so readily. A rope is sometimes used, which is weighted at the ends to prevent sagging. There is always the danger that the weighted ends will fly around and hit somebody, or that the jumper will get tangled up in the rope, and possibly hurt himself.

No matter what is used as a cross-bar, a cloth or handkerchief should be hung over the middle, in order that the jumper may see the bar plainly at all times.

THE STANDING HIGH JUMP. — This event is of value only as one form of exercise. It is still popular in some parts of the country as a competitive sport; but its interest is slight, and the

physical benefits are not of great value, and can be more easily obtained by the running high jump. However, for those who might wish to try it the following description will be of service.

As the name implies, no run or steps are allowed. The jumper stands with his right side to the bar if he is a "left-foot" jumper, or vice versa. The distance away from the bar must be determined by practice, and will depend upon the jumper and the height of the bar.

With the feet side by side, the hands held high over the head, swing the arms downward and backward, and at the same time bend the knees or squat down, keeping the trunk upright. The arms are then swung forcibly upward, and a quick, hard spring is made with the legs. The inside leg is brought upward and over the bar, followed by the other leg, so that the position when the body crosses the bar is the same as that of a person sitting with both legs extended forward, one on the far side of the bar and the other on the near side.

If you swing the jumping leg as hard as possible, it will still be going higher than the bar, while the first leg will be over and dropping. Land on the first foot to come over the bar, not on both feet.

The action of the arms is most important, as they not only help lift the body, but they also balance it. When they are swung upward, see



as thirteen to fifteen inches. Of course it must be a jump; that means taking off from the feet, and landing on the feet.

It will be found necessary to lower the top bar more rapidly than the lower is raised, or the height will become too great for very small pupils to jump.

BROAD JUMPING. — The running long or broad jump is a form of exercise that requires the ability to sprint, and, to a certain extent, to jump high. The first essential for any broad jumper is speed. Sprinting for short distances should be part of the daily programme. See pages 43 and 44.

The second essential is "form," by which a jumper is enabled to control his body during the run, when leaving the "take-off," while in the air, and on alighting.

The third essential is the ability to approach successfully and rise or spring from the take-off while running at full speed. To neglect any one of these would be to sacrifice success.

As to the second essential, or form; here the most important requisite is "elevation." Any boy who has handled a garden hose knows that by raising the nozzle a little the water is made to go much further than when the nozzle is held level. This applies just as truly to the jumper. By springing up or getting "elevation" the

jumper will cover more ground. When the jumper leaves the "take-off," the body is inclined slightly forward, and the legs and the arms are in front of the body. When about to land, the body is thrown forward; and the legs, if bent, are extended to the front. This will prevent the jumper from falling backwards.

The third essential is the "take-off." Absolute confidence in getting a correct "take-off" is the secret of broad jumping. There are several methods of securing the right distance from the run to the "joist." The "joist" is the line from which the jump is made, often marked by a wooden plank set in the ground. The easiest way to secure the right distance is to scratch off a line, approach this scratch on an easy run, and begin a hard sprint, from either foot, after crossing it. Note which foot strikes the line; sprint about fifty or sixty feet; then leap from the natural jumping foot. Mark this spot, and by measuring the distance between the first scratch and the second mark the jumper will have an approximate idea of how far from the joist he should begin his sprint. A very little adjusting will give an accurate measurement. This distance should always be remembered. The assurance of being able to get the correct take-off will make broad jumping sure and much easier.

The exact length of the run before reaching



FIG. 21. SHOWING THE PRELIMINARY ARM AND FOOT
WORK IN THE STANDING HIGH JUMP

The side is to the bar.

the take-off is a matter that the individual must decide for himself. A too long run will not only tire the runner, but also curtail the length of the jump. A too short run will not give the momentum necessary to carry the body its greatest distance. The best jumpers run anywhere from sixty to seventy-five feet; few run less than that.

If the jumper has got his take-off correctly, which we will say is forty-five feet from the scratch, the next thing is to mark off a second distance about fifteen feet behind the forty-five-foot mark. Standing on this second mark, the jumper runs, at gradually increasing pace, so that his proper foot lands on the forty-five-foot line. From this point the top speed is maintained until the next to the last step from the "joist," when the speed is not modified, but the stride is shortened just enough to allow the athlete to prepare himself for the actual jump.

When the jumper hits the "joist," he should see that just the ball and the toes of the foot are on the board, and the heel is on the ground. If the heel hits the board, the resulting jar to the spine is liable to cause trouble. The knee of the jumping foot is slightly bent and well under the body. Do not allow the body to lean backward; if anything, slightly forward. The off leg is swung powerfully upward, and at the same time the arms are thrown upward and forward.

Every movement should have its share in assisting towards "elevation" and distance. Some jumpers while in the air make efforts to gain distance by kicking with their legs; as a rule, this hinders instead of helps. As soon as the drive from the jumping leg is finished, the knees should be drawn well up and the chest and arms carried in front of the hips.

Just before landing the feet are shot ahead and the body is thrown forward. The arms, which have been held in front, may now be used to help balance the body by swinging them backward past the feet. This also helps in rocking the body forward.

It is very important that no part of the body should touch the ground behind the indentation made by the feet on landing, as the measurement is made from the "joist" to the nearest break in the dirt, no matter how it is made.

Practice for the broad jump should consist of sprinting, and actual trials for distance in the jump should be made only three or four times a week. The jump is hard on the system on account of the shock. The real work should consist of getting the speed, the take-off, and the elevation.

RULES FOR THE RUNNING BROAD JUMP. — A "joist" five inches wide shall be sunk flush with the ground. The outer edge of the "joist" (the



FIG. 22. SHOWING THE START IN THE STANDING
HIGH JUMP

The arms forcefully lifted and the right leg raised.

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edge toward the jump) shall be called the scratch line, and the measurement of all jumps shall be made from it at right angles to the nearest break made in the soft ground, or in the turf or earth outside the soft ground, by any part of the body of a competitor.

A foul jump shall be one where the competitor, in jumping off the scratch line, makes a mark on the ground immediately in front of it, or runs over the line without jumping, and shall count as a trial jump without results.

Each competitor shall have three trial jumps, and the competitors finishing first, second, third, and fourth in the trial jumps shall each have three more trial jumps.

The competition shall be decided by the best of all the trial jumps of the competitors.

A fair jump shall be one that is made without the assistance of weights, diving, somersaults, or handspings of any kind.

STANDING BROAD JUMP. — Whenever the space is limited, the standing broad jump as well as the standing high jump are very suitable substitutes for the running jump. The standing broad jump is a form of exercise that can be taken at will, and has no injurious after-results. The only requirement for success is spring and practice.

As in the running jump, the "elevation" and

the arm action are of the greatest importance. The legs are used to furnish the motive power, but a good jumper depends upon his arms not only to balance the body, but also to get the necessary lift. The following rules should be observed.

Stand erect, with both toes on the starting-line, feet in any position but preferably close together, hands raised high in air. Now swing the arms forward and downward past the legs and well in the rear; at the same time bend the knees and lean slightly forward from the hips, keeping the feet in the same position. Next start the arms forward and upward again; and, as they pass the knees, push hard with the legs. The body being inclined forward, the action of the arms is of such a nature that, as the leg-push is begun, the arms will have started upward. Swing them forcibly forward. The body will then incline forward from the heels to the toes, so that when the body leaves the ground it is in the same position as in the running broad jump. The legs are pulled up quickly and shot forward at the correct time to ensure proper landing. The athlete uses arms in the landing to help rock the body forward by swinging them backward past the feet.

The feet of the competitor may be placed in any position, but are to leave the ground once only in making an attempt to jump. When the



FIG. 23. THE RUNNING BROAD JUMP

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feet are lifted from the ground twice, or two springs are made in making the attempt, it is to count as a trial jump without result. A competitor may rock back and forward, lifting heel and toes alternately from the ground, but may not lift either foot clear of the ground, nor slide either foot along the ground in any direction.

In all other respects the rules governing the running broad jump govern the standing broad jump as well.

ONE, TWO, THREE STANDING BROAD JUMP. — The method of procedure is the same as in the single jump, with the exception that the second and third jumps must be made without stops or without extra motion of the feet. The tendency is to hesitate and take a little extra hop in preparation for the second spring. This is particularly true if the first leap is too long. The jumps should be graduated, number one being short, number two a little longer, and number three as long as possible. The important point in this form of jumping is not to lose momentum between jumps. Of course, as the jumper becomes more proficient, the actual length of each jump may be increased considerably.

THE HOP, STEP, AND JUMP. — This style of jump combines all others, and will always be a

popular form of exercise provided the necessary space is obtainable. It, like the other jumps, may be taken with or without the run. For small enclosures the hop, step, and jump without the run will be more satisfactory. For large spaces the running start is preferable.

Very often pupils will become confused regarding the order in which this event is carried out. To prevent any doubts, the teacher should have each pupil practise simple hopping, that is, raise one foot from the ground and jump forward with the other leg, keeping the free leg clear of the ground. Next, combine the hop with a step. Hop as just described, and as soon as the foot touches the ground swing the free leg forward as far as possible, and jump from the rear to the front foot. Lastly, put all three movements together, which simply means the addition of a regular broad jump from the foot farthest advanced, both feet landing together at the end of the jump.

To make this plainer, the following example is given. A boy who jumps from his left foot lays out his take-off as previously described under broad jumping, which should be about fifty feet back of the scratch used as a starting-line, and assures himself that this is correct. He then runs at full speed, hitting the joist or starting-line with his right foot, and hops on to his right foot as far as possible without losing



FIG. 24. THE STANDING BROAD JUMP
Getting elevation.

ORIGINAL
COPY
SERIES

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his balance or control. Immediately on landing he makes a long jumping step from his right to his left foot, and then without any hesitation completes the third move, which is an actual broad jump. By a little practice these three movements will become automatic, and an athlete can soon cover a surprising distance.

It is better to make the hop and the step rather short at first, as a great exertion in either will cause a loss of balance, or place the body in such an awkward position that it will either be impossible to continue the following movements or will render the best efforts of no avail.

IX

POLE-VAULTING

THIS form of exercise is hardly suited to a young person; and, should it be attempted, the utmost care must be used in preventing accidents. The slightest upset at the start may thoroughly discourage a boy from further attempts.

The length and weight of the pole, poor and improper landing-places, lack of strength, and shortness of stature are big factors against pole-vaulting. The regulation pole is sixteen feet long, about an inch and a half in diameter, and may be made of hickory, oak, ash, pine, or bamboo. The bamboo pole, being the lightest and most flexible, is rapidly becoming popular.

The absurdity of asking a boy under fifteen to run and carry correctly a pole of this kind is obvious. Smaller poles may be secured; but the advice of an experienced vaulter should always be sought before trusting one's welfare to any kind of stick, as even a small knot in the stick may cause it to break, and a big fall will result.



FIG. 25. HOW TO GRASP AND CARRY A POLE

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Vaulting is by far the most difficult and strenuous of all so-called field-events. It is a sport that requires long practice, good chest and arm muscles, speed, endurance, and courage, all of which can be developed by conscientious use of the exercises given under "Directions for Developing the Various Parts of the Body."

For the boy who is inclined toward pole-vaulting an early start will prove of greatest value. This beginning, however, should not consist of actual vaulting, but should be purely preparatory or developmental. Practise rope-climbing, springing, jumping, rope-skipping, high kicking, and all the chest-weights which have a direct bearing on the vault.

The following simple preparatory exercise is used by the world's champion pole-vaulter. Suspend a long climbing-pole from some overhead beam, with the free end about two feet from the floor. Place the jumping-standards on each side of this pole with the cross-bar touching it. Begin with the cross-bar between two and three feet from the floor. Grasp the hanging pole at an easy height with the top hand, letting the other hand grasp it about a foot or eighteen inches below. Then walk back two steps, retaining this grasp on the pole, the object being to vault over the cross-bar.

As the vaulter retraces the two steps prior to the jump, he should see that the second stride

brings his jumping foot into place directly under the body and in position for the leap. Very slightly in advance of the placing of this jumping foot the lower hand is raised by sliding to within several inches of the upper hand, which remains in its first position.

The jump is then made; the legs are shot up and over the bar; the arms are used to pull the body up to the hands; and the turn of the body, which will follow naturally, causes the abdomen and the chest to face the bar. The arms are then extended, and a strong push away from the pole will raise the body clear of the cross-bar, and also throw the pole so that there is no danger of displacing the bar by having the pole follow.

This simple description sounds very easy, but a few trials will convince one to the contrary, as the exact timing of all the moves results only from considerable practice, while the strength required to raise and push the body upward is not always developed. The entire movement, however, is almost identical with that used in vaulting with a regular pole. It will be seen that the ability to push and pull up is of vast importance.

The first thing to practise after the pole has been selected is the method of holding and running with it. Correct form in this is as essential as the vault itself. A poor approach will unbalance the vaulter to such an extent that



FIG. 26. THE START



control of the body will be impossible. To be able to run at full speed with arms free is altogether different from doing the same thing with a long pole in the hands.

The pole is carried on the side, at right angles to the body and against the hip-bone. The forward hand is held with the thumb and first finger facing the body, the little finger facing the pole end. The rear hand is held back of the body with the thumb and forefinger facing out, and the little finger facing the body. The rear arm is straight or only slightly bent; the front arm is curved across the chest. If the vaulter is a "left footer," the pole is carried on the right side; if a "right footer," on the left side. The rear hand may be rotated inward so that the pole will rest across the forearm and thus give a little more steadiness. The front end of the pole is carried on a level with the eyes, not up in the air. This method means that the vaulter runs in his natural position. If the pole is carried across the body, there will be a great loss of time in planting the pole and shifting the lower hand, or the run will be sideways, thus cutting down the speed.

When the boy is sure of control of his body and has learned to run with the pole, the next thing is to locate a "take-off" mark, which may be done in a manner similar to that described under the high jump.

In this instance the run varies. Some prefer a long, fast run, depending more upon momentum to carry them over; others use a short, fast sprint, relying more upon the "pull and push." The latter style is better, as less energy is expended in the run, and strength is saved for the actual vault.

In practising the run it is well to learn how and where to plant the pole and to make "the shift." This consists of raising the lower hand up to the top hand, and is made simultaneously with the planting of the pole. A hole about a foot long and six inches deep is dug just under the centre of the cross-bar. This hole receives the end of the pole, and prevents slipping. Planting the end of the pole in this hole should be tried until it becomes second nature. To plant the pole and to shift, use the lower hand as the motive power, the other hand as the guide. On the last step, just before the jumping foot lands, the rear hand is raised backward to lower the end of the pole; then quickly both hands shove the pole into the hole, while the lower hand is raised to the upper. This will all be accomplished just as the jumping foot hits the ground, and leaves the body directly under the hands, the arms extended, and the free leg on the rise.

The next thing is to measure off the position for the top hand on the pole. This changes slightly with different heights, and must there-



FIG. 27. ABOUT TO PUSH AWAY
FROM THE POLE



fore be done before each vault. Stand the pole up in front of the cross-bar so that it touches. Note the point on the top of the cross-bar opposite the pole. Now let the vaulting-pole drop back, and grasp it with the upper hand at a point six inches above the mark noted. The upper hand is left or right according to the side on which the pole is carried. The lower hand then grasps the pole at an easy balancing-distance, usually between twenty-four and thirty inches.

Starting a short distance behind the take-off line, run slowly toward the uprights. When the scratch is reached, increase the speed so that when the time comes to plant the pole the speed is at its maximum. Here the preliminary practice of shifting and planting is of value. The free leg is swung upward just as the leap into the air and the strong arm-pulls are made. Next, both legs are swung upward, leaving the body at a sharp angle. This motion is also a twisting one of such a nature that the face and the abdomen shall be down. As soon as the feet and legs are over the bar, the body is pushed up hard with the arms. This movement should cause the body to clear the bar, leaving only the hands on the side of the bar from which the vaulter has come, the legs being on the downward course. The last motion is to shove away from the pole with the hands, at the same time

throwing them upward to do away with any chance of displacing the bar. The remainder of the vault consists of the landing; and attention should be given this, as good control will prevent many falls.

Several matters, such as grasping the pole, speed, height for the upper hand, extent of shift, and other peculiarities of form will come up, but these must be settled by experience. What has been given here is sufficient to start a boy. Practice alone will make perfect. Plenty of practice, not too much for height; attention to shift, planting pole, form, strength of arms and back, endurance and courage, are the essentials for all successful pole-vaulters.

POLE-VAULTING FOR DISTANCE. — The principle of this is the same as of vaulting for height, except that the pole is carried along with the runner, and the use of the legs is more of a swing outward instead of upward. The object is to cover as long a distance as possible without height. Speed in this event is maintained throughout.

FENCE-VAULTING. — Under this heading come the forms of vaulting that are accomplished without the aid of a pole. Any object like a fence may be used, but the most desirable is the horizontal bar, which is adjustable to all heights



FIG. 28. A BEAUTIFUL VAULT

from one foot to six or seven feet, and is graduated in inches. A bar of this nature allows handicap vaulting, and offers opportunity for improvement and competition.

A bar may be easily constructed by sinking two eight-foot posts into the ground for two feet, and six to seven feet apart. The cross-bar is of either steel or strong wood, and is placed between these uprights. It is held in position by either clamps or pins running through the bar and posts. When the bar is at a low height, the vault is merely a side jump over, using the hands to steady the body. When the bar is raised, however, the use of the arms becomes necessary; in fact, the arms will be doing all the work.

For example, the bar is at the height of the chest. The pupil stands a little to one side of the bar, and with both hands grasping the bar about the width of the shoulders apart and directly in front. The arms are slightly bent. Now bend the knees, and squat down until the arms are nearly straight. Jump vigorously from the floor, and at the same time pull up hard with the arms. The head and shoulders should keep in a straight line from the floor up, but the legs are swung up to the side and over the bar. Keep the feet together if possible, though this is not required. If the jump and the arm pull are rightly timed, the body should go over the bar.

To prevent touching, the head and shoulders are thrown forward, and the arms, which are slightly bent, should be pushed up, thus giving the extra height and the forward motion necessary to clear the bar. Sometimes the vault is made with no bending of the arm. This is a prettier jump, but the vault will be much lower. Here, again, the style can be changed to suit the boy; but all forms demand a good, strong pull and perfect control.

LEAP-FROG. — This form of leaping should not be forgotten in this day of strenuous exercises, as it embodies more real training for the body than one would believe. It is a branch of vaulting, and can be made an interesting event for competitions by small boys. Leap-frog races, leap-frog for height, and leap-frog for distance are three examples that deserve mention.

In order to play leap-frog two boys are necessary. One boy leans forward from the waist, bending the head well down on the chest. The hands are placed on the legs anywhere between the ankles and the hips. The feet are spread apart to afford a firm base. By placing the hands low or high the height of the jump can be easily regulated. The second boy runs, and, placing his hands on the first boy's back, leaps over him, goes forward one step, and assumes the position held by number one, who is now the



leaper. The boys may either stoop forward or stand sidewise; the former is better, as the head is protected.

For leap-frog races all the boys line up behind a mark in a row. There should be two teams, side by side. When all is ready, the first boy runs two feet beyond the line and bends over. Number two leaps over number one, and takes a similar position about four feet away. Number three now jumps over number one and number two; and he, in turn, bends down for number four; and so on until all the boys have had a jump. As soon as the last boy is on the ground, in position, number one jumps number two and all others in front of him. After jumping the last boy he runs to a given point ahead and waits. The others repeat this in order. The first team to get all its members beyond the line is the winner. Each boy gets a chance to leap over all the others; and, if one falls, he must return to position, as a failure on the part of one boy to leap all the others disqualifies that side.

Another way is to have one boy stoop and all leap over him. After all have leaped he advances one step farther from the scratch, and the boys leap again. This continues until the leap becomes quite difficult. If one boy fails to make the leap, or in doing so throws the stooping boy, these boys exchange places, and the race begins again.

In leaping for distance the stooping boy takes up his place two feet from the line, and each boy leaps. By gradually moving up, the distance covered will be steadily increased. By a process of elimination the contest will finally reach the one best leaper.

In leaping for height the stooping boy begins very low, gradually straightening up. As a boy fails, he drops out. With practice boys can learn to vault one another's heads, when standing erect.



FIG. 30. POLE-VAULTING. CLEARING THE BAR



FIG. 31. START OF SHOT

10
9
8
7
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3
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1

49

X

WEIGHT-LIFTING

WEIGHT-LIFTING for young boys is extremely risky, and has been completely abandoned by all modern teachers and coaches. The very condition of a boy's body is the principal argument against the practice. Nevertheless, there are no reasons why, if the boy is asked to "chin himself" by raising his own weight, he should be submitting his body to undue strains if he does light weight-lifting. Therefore with this idea in mind the following suggestions are made.

Work only until the muscles begin to tire, then rest.

Work a little each day, rather than much on different days.

Begin with the lightest of bells, and work up to the heavy.

Don't strain while trying to raise a bell; put it down, and try a few days later.

Vary the weight-lifting with exercises that call for hanging and arm-swinging.

Too much of the bell work will not only give you big, sluggish muscles, but may leave you "muscle-bound."

Better good quality of muscle than a quantity of it.

Never use a bell of more than twenty-five pounds until past sixteen years of age.

When working with light weights, always stand with the heels together, chest out, and hips back. If working only one arm, place the free arm on the hip, fingers front, elbow back. When using heavy weights, spread the feet and assume a position of sure balance.

1. *With bells, each five pounds or under:*

Right arm: 1. Raise the bell upward and forward, hand shoulder-high, palm in. 2. Raise the bell upward and sidewise, hand shoulder-high, palm down. 3. Raise the arm over the head, palm front. Repeat with the left arm. Alternate right and left.

2. *Bell on shoulder:*

Right arm: push the bell up, over head, look up. Left arm, the same.

3. *Bell in the right hand:*

Palm front, bend elbows, bring the bell to the shoulder. The same with the left. Alternate.

4. *With bells under the armpits:*

Bend the body to the right, right hand down, left hand up. Alternate.

These exercises should be taken slowly, and only a few times at first. Increase the number of times rather than the weight of the bell. Increase the weight gradually.

With bells weighing more than five pounds and less than twenty-five pounds:

1. Lying extended on the abdomen, the bell on floor in front of body, grasp the bell with the right hand, keep the elbow on the floor, raise the bell. Repeat with the left hand. Both hands.

2. Lying extended on the back, bell over the head, grasp the bell with the right hand and pull to the chest. Push it up to a vertical position, and lower it to the chest. Repeat with the left hand. Both hands.

3. In the same position as No. 2. Raise the right hand from the floor beyond the head, up to a vertical position, and bring it back to the floor without bending the elbow. Repeat with the left hand. Both hands.

Standing with feet apart:

1. Raise the bell from the floor over the head with the right hand. Repeat with the left hand.

2. Grasp the bell with both hands, rise, and bend forward, keeping the back straight. The bells may be raised to the chest and lowered, or the arms may remain straight.

3. Holding a bell in the hands, raise the heels, bend the knees, straighten the knees, lower the heels.

XI

SHOT-PUTTING

THE modern shot-put is derived from the old-time exercise of "putting the stone." Originally an event for only the strong man, it has gradually been changed into an event of practical value in college and amateur athletic circles. It is no longer an event intended for the "big boys" alone, but enjoyed equally by men, boys, and girls. For years it was considered a dangerous sport, and as long as the article used was of so great weight, from sixteen to twenty pounds, it was rightfully considered injurious for any but the well-matured and developed man. In these days the shot is a small, round, compact one of varying weight, and can be taken up with no fear of strain. In fact, the greatest danger is not to the athlete, but to the spectators. At times the onlooker is injured by standing too close to the shot-putter, and it should be made an iron-clad rule that all spectators, coaches, etc., should stand at least thirty feet away from the putter and to one side or back of him.



FIG. 32. SHOWING THE BALANCE AFTER PUT



Shot-putting is a science that requires patient and persistent practice, and the beginner should not become discouraged if results are unsatisfactory. Several years may be devoted to the form of putting the shot before the "knack" is acquired; but, once learned, the amount of work will be very small, merely enough to keep the body in good physical condition.

From the standpoint of physical development the work with the shot is of great value. In order to be even a mediocre shot-putter requires about all the essentials of physical fitness. Strength of arms, chest, shoulders, and legs is necessary to handle any kind of weight. Speed and quickness are imperative, while accuracy and control give assurance and confidence. In a word, shot-putting is a movement of harmonious co-ordination between mind and muscle.

The idea so prevalent that big muscles and height are absolutely necessary for shot-putting is wrong. While it is true that most of our shot-putting champions are giants in stature, it is also true that they are men who usually follow other weight events besides the shot. Such wonderful men as Rose, Magrath, and McDonald are experts with the fifty-six-pound shot and the hammer, two events that demand heavy bodies and large muscles. Elliott, a member of the New York Athletic Club, weighing between 135 and 140 pounds, won the junior championship

from men almost twice his size. His ability lay in the fact that he had speed, control, and form; and as an all-around athlete he was far superior to the "big men." Of course the big man always has the advantage of reach, and should by all laws of nature be the better man. But the boy of thirteen or fourteen is not in the position to tell whether he will be a six-footer; so, if for no other reason than the training, he should begin right; and, if in later years he possesses a large physique, he will be in a much better position to become a "world-beater" than if he had started late in life.

The first thing for every boy to do is to take all the exercise he can get that will help toward the development of his shoulders, arms, and body. Rope-climbing, body-bending, pulley-weights, push-ups and pull-ups, and deep breathing, are all valuable exercises. Continual practice with the shot itself is best of all. Firm, not heavy and sluggish, muscles are desirable.

The next important item is speed; every motion made in shot-putting is one of speed and push. The more quickly the boy can move, the more momentum he can give the shot, the greater will be the throw. To this end, rope-skipping, sprinting, hopping, and jumping forward with a half-turn of the body, should be practised regularly.

The most frequent fault with beginners is the

tendency to overdo the speed, which causes a loss of balance at the end, as well as a poor delivery. The speed should be encouraged, but work up to it gradually. Insist upon form first, speed next, and actual put last.

For the put itself the absolute rule is "elevation." Plenty of height, combined with speed and strength, will assure one a good distance. Without this elevation the boy is merely wasting his time. Instil this idea and that of looking upwards, and the distance will come exactly in proportion to the energy in the effort.

Don't let a beginner overexert himself. This is easily prevented by using a light weight while learning and by changing the hands every few puts. This gives the body a more uniform development, and prevents overworking one arm. Then, too, the idea of having puts made with each hand and adding the total is becoming more popular, and a few years may see this method of putting made a part of the regular events.

Weights vary from five to twenty-four pounds. The standard shots are sixteen pounds for all amateur or collegiate championships, twelve pounds for scholastic games, five pounds for public-school boys. A simple home-made shot can be made by filling a bag of strong leather with B. B. shot. This kind may be used indoors as well as out, but the bag is very likely to break

at the wrong time. The lead shot is more expensive, but by far the more easily handled. If the shot is put indoors, gymnasium mats must be used for a landing; otherwise the floor will be ruined.

The following description is for a right-handed putter. If the boy is left-handed, reverse the entire performance. It is always best to explain the difference between a throw and a put. The former is illegal, and counts as a foul. The motion of throwing is easily shown with a ball or a stone; the act of putting is done without any arm-whip, and is a direct push from the shoulder instead of a swing.

If space permits, lay off a circle seven feet in diameter. Secure a toe-board if possible — a section of wood shaped like the arc of a circle. This is used as a buffer; a step beyond it constitutes a foul. Having drawn the circle, draw a diameter separating the front from the rear sides.

In practising always walk out from the rear of the circle; to leave by the front is a foul. It is also a wise plan to save the putting arm as much as possible; so, instead of carrying the shot into the circle with the right hand, either roll it in or carry it with the left hand. Attention to these small things may seem unnecessary, but such small savings may mean the extra inch that wins the point.



FIG. 33. A PUT COMPLETED

ALAN
C. 1920
C. 1920
C. 1920
C. 1920
C. 1920

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14

The boy takes up his position at the rear of the circle, his right foot almost touching the line, his left side turned at right angles to the centre line. The left leg is placed at easy standing-distance and on a line with the right foot. The right knee is bent and the left leg is straight, with the toes touching the ground just enough to balance the body. Most of the weight is on the right foot. The right arm is bent, and holds the shot; the wrist is straight or bent as the case demands. The shot is held close alongside the neck, with the elbow facing the front and also close to the side. The head is turned with the face looking over the left shoulder, the body leaning slightly to the right. The left arm is held out straight to keep the body in balance.

Now swing the left foot across and in front of the right, keeping the body as nearly as possible in the same position. Then forcibly swing the left foot back again, at the same time hopping toward the front of the circle from the right foot, keeping the left leg clear of the ground until the right lands; then both feet should touch at the same time and in the same position as in the start. The hop should cover about three feet.

As soon as both feet land, the athlete should make a slight jump forward and execute a half-turn by swinging the left arm backward to the left, with a quick twist of the shoulders. At the same time push the right arm up and diagonally

front. This jump is so taken that at the time the shot is delivered the right foot is just inside the front edge of the circle, the right arm is extended as far over the edge as possible, the whole body being balanced over the right foot, while the left foot and arm are being used to keep the body from following the shot across the line. (See Fig. 33.) To touch the ground outside of the circle with any part of the body is a foul, and throws out the "try."

These movements should be taken very slowly at first, and should be thoroughly mastered before speed is attempted. In making the turn the right leg is used to drive the body forward and around. Do not try to jump high in the air. A person has a better chance to use his strength on the ground than in the air. Turn fast and low. Having completed the put, turn and walk out at the back part of the circle. Always keep the eyes up in the air; to hang the head means to put the shot low, and height counts almost as much as strength.

XII

THROWING

THROWING THE MEDICINE-BALL. — A form of exercise that may be varied in many ways for contests of individuals or large classes is tossing the medicine-ball. This article is usually a large leather ball filled with felt or cotton, and of any weight from three up to sixteen pounds. It is large and soft, and heavy enough to make exercise with it of excellent value. With two or more such balls and a little ingenuity on the part of the teacher, many games can be played that are amusing, exciting, and beneficial. Only one or two examples will be given.

No. 1. The medicine-ball is used as a shot, and the method is the same as that described under the shot-put.

No. 2. Stand with legs apart, heels on a line, and throw the ball backward, over the head, for distance.

No. 3. This is for class use. Form two rows, and pass the ball between the legs from the front to the rear of the row; the last boy then runs to

the front and the operation is repeated. When the boy who was number one in each row is again in that position, the game is completed. The victory is with the side whose number one gets back into position before the rival number one.

No. 4. Form a circle, two players inside. Those on the circle pass two balls from one to another, in any direction, the balls being separated. The boys in the ring try to get possession of the balls; and, when one succeeds, he changes position with the one from whom the ball was taken.

These four illustrations can be varied in many ways, giving excellent forms of recreation for classroom, schoolyard, or playground.

DISCUS-THROWING. — This is an old Greek sport, and its method is rather complicated, especially for young players. The following is a slight modification, but the regulation style should be attempted only in the presence of some expert discus-thrower, who can point out the errors and give the proper form from the start.

The discus secured may be of almost any weight, but one of four and six-tenths pounds is not too heavy for a boy. It is a circular disk with biconvex sides, oval in shape, and has ridge-like projections on either surface. It is made of wood, with a heavy metal band as a border.

The discus is thrown usually from a seven-foot

circle, as in the shot. As even experts find difficulty in controlling the discus, it is imperative that plenty of space be allowed to protect the spectators.

The discus is delivered with the arm straight. The edge of the weight is held in four fingers, the thumb resting on the side and against the forefinger.

Stand with the left foot on the line, the right foot a pace to the rear, the body facing front, and the discus in the right hand. Swing the discus forward and across the body, using the left hand to keep the discus in place by grasping it as the right hand comes forward and releasing it as the right hand swings back. Swing the discus forward and around to the rear of the body, twisting the body and bending the knees in order to get all of the leg-drive and body-swing in the throw.

Then swing the discus forward, helping with legs and body. At a point just before the end of the swing release the discus. It should sail well upward, and have the same whirling as when one scales a flat stone. Care should be taken not to cross the starting-line, which constitutes a foul.

The point where the discus first strikes the ground is the measuring-point.

The greatest difficulty will be in scaling the discus. By experimenting with the method of

grasping, this can be overcome. When the discus leaves the hand, the palm is facing downward; and a quick wrist-snap will often give the scale needed.

THROWING THE JAVELIN. — This form of exercise has only recently been adopted as a recognized sport. Even yet it has not been taken up by either the colleges or the public schools, but it is a matter of only a few years when javelin-throwing will be a regular event in all our athletic meets. For the young boy or girl it is not only a splendid sport, but is of value because of its freedom from muscular strain, and is undoubtedly a more desirable contest than the hammer-throw. It is also a much more pleasing form of entertainment to the spectator. Then, too, it is equally adapted to the large and the small, and requires mostly speed and control, two factors which may be acquired if not already developed.

Plenty of space is needed, however, and this is not always to be obtained; but for those who are so fortunate as to be near suitable grounds the method of throwing is described.

The regulation javelin is about eight and one-half feet long, weighs about one and one-half pounds, and is planed to a round, smooth surface, tapering slightly at each end. To one end is fastened a long, sharp-pointed iron or steel

cap, so that the weight of the cap will tend to hold the direction, and it will stick in the ground wherever it lights. As much run as is desired can be taken, but the thrower must not cross the foul line, which is drawn at any convenient place.

In running it should be borne in mind that the best throw can be made only when the foot opposite the throwing hand lands in front at the time of the throw.

Start the run, holding the javelin in a well-balanced position, the point extended in front and lying in close to the chest. The arm should be straight and extended diagonally backward and downward. Run with increasing speed toward the foul line. This run should have been so regulated that just before reaching the foul line the left foot lands foremost and about four feet away from the line. Now give a quick, sharp turn and jump to the left, at the same time throwing the javelin up and away by a forcible movement. When the javelin has been thrown and the movements are completed, the body will be in a balanced position over the right leg, the left leg and right arm being extended to keep the body from falling forward.

XIII

CLIMBING

CLIMBING has become almost obsolete as an athletic event. This is unfortunate, and yet there seems to be no effort on the part of our teachers to retain an exercise that is of so much importance. Very few of our men to-day could climb a pole or rope if their lives depended upon it. Our hotels often have rope fire-escapes; yet how many people could use them with safety? Climbing, like crawling, is the result of instinct, but years of disuse have about smothered what is really of paramount importance. Every boy and girl should know how to climb and descend both a rope and a pole, and to this end a few suggestions will be of value.

In the first place, to hang a pole or a rope is a matter of moderate expense, and the work can usually be done by the boys themselves. Any soft, pliable rope will do, or any long, smooth pole. A good thickness for the pole is one and three-quarters inches, the length about twenty feet. The pole can be made either to swing or to remain stationary by strapping it to the

ground. If a rope is used, it may be smaller, or about one and one-half inches thick.

Another good exercise is obtained by the use of a heavy pole from the sides of which either wood or iron braces protrude. The appearance is the same as that of the telegraph-pole. The distance between the braces or spars may be regulated by the size of the boys or girls using the pole.

There are many methods of climbing; but only three will be mentioned, and these in the order of their difficulty.

For girls the first two are suitable, the third being more difficult and adapted to the older boys, who have a fairly good muscular development.

In any form of climbing the main requirement is the "pull-up" or "chin," a short description of which will not be out of place. It should be practised daily until the pupil is able to raise the body "chin-high" several times.

To chin one's self is to raise the body from a hanging position by the arms until the chin is on a level with the hands. This is accomplished mainly by the strength of the upper arms, though a little kick may be of help in starting the pull. Hang from a bar or the limb of a tree so that the feet clear the ground and the arms are straight. The palms of the hands should be facing the body, and as far apart as the shoulders.

If possible, the lift is accomplished without jerking the legs, merely by a sharp pull of the arms. If the movement cannot be made otherwise, a quick, snappy, upward kick of the knees at the time of the pull will help to start the body, thus enabling the arms to keep it moving.

TO CLIMB IN THE EASIEST AND MOST NATURAL WAY. — Stand with hands grasping the pole, the hands as high over the head as possible. Jump upward, pulling with the arms, and twine the legs about the pole. Use the legs as a vise to keep the body from slipping down. Now reach up again as far as possible, sliding the hands over the pole, and pull the body up to the hands. Release the legs, and renew the vise-like grip at the new and higher point. Continue this until the height desired is reached. It will be found that by pushing up with the legs the pull on the arms will be lessened.

To twine the legs about the pole, grasp the pole between the thighs, with the knees bent; swing the left leg around the outside of the pole and catch the toe and outer side of the instep on the inside of the pole. The right leg is thrown around behind the left leg, and the toes are used to fasten the left foot securely to the pole.

The second method is practically the same as the first, with the exception that the hands alternate, reaching and pulling up. When the jump

is made, the right hand grasps high, and the left about eight inches below; then, when the pull is made, the left hand grasps the pole above the right at about the same distance. The arms thus gain height on each pull, and the legs move up with each movement of the arms. This is a quicker but more tiring method.

The third method is hardest, and is done without the use of the legs, except to kick. They do not grasp the pole at all. The arms do the work as in number two, the foot opposite to the upward arm being swung forcibly upward, thus giving a slight momentum which helps the work of the arms. This is called "hand over hand," and requires considerable practice.

In descending never slide down, as the friction will burn and blister the hands badly. Always reverse the movement of climbing upward.

If the poles are swinging, many forms of jumps can be given, such as high and broad jumping, the jumps being made on the forward end of the swing, and being taken either with or without a run.

An easy little rest trick on the rope is to climb a certain distance, then form a loop over the thigh by bending down and gathering in the rope with one hand, winding the rope around the body, or merely holding the rope with the other hand, the hand that grasps the rope supporting the body.

XIV

KICKING

THERE are few forms of exercise that actually bring so many muscles into action as that of high kicking, though unfortunately it, like climbing, has long since been dropped from the list of competitive sports. Ray Emery, the world's champion standing high jumper, says to the beginner: "To strengthen the abdominal muscles, use the kicks, especially the double-footed kick, which will also teach control of the body while in the air." Harry Porter, Olympian champion high jumper, says, "Practise high-stretch kicking every day; it will keep the legs under good control." Inasmuch as the object of all physical exercise is to develop and maintain perfect control of the body, the advice of these two men is of double value.

Kicking, unlike any other form of training, can easily be practised in one's bedroom, and is accordingly within reach of every one who is interested in the care of the body. The work is free from severe muscular strain, and the risk

of injury is practically absent. The apparatus is inexpensive, simple, and takes up little or no space. Of course, if a pupil wishes to do the running high kick, the gymnasium or yard is necessary; but for the standing single-leg exercise a small corner will suffice.

The simplest kind of apparatus is made by taking an ordinary tambourine or a tin pie-plate, fastening a cord to it in such a way that the bottom surface is the part to kick. Insert a small screw-eye in the ceiling, thread the cord through this, and fasten it to any convenient nail or hook. By nailing a yardstick to the wall so that when the loose end of the cord is looped over the one-inch mark (little hooks having been inserted at regular intervals) the tambourine will be four feet from the floor, the actual height can always be determined, as each inch the loop is lowered will mean a corresponding increase in the height of the tambourine. This will register anything from an easy kick of four feet to a difficult one of seven feet.

The first method of kicking is the standing single-leg kick. This needs no description, but practice will show that, as the tambourine is raised, the kicker must stand closer. The toes should be pointed straight forward and the leg swung straight. Practise with both legs so that the development will be symmetrical.

The second method is as follows: Stand with

both feet together, the hands at the side, swing the arms forcibly upward, jump from both feet, and raise either leg to kick the tambourine. This is excellent exercise for both high and broad jumpers. Alternate the kicking leg.

The third method is usually taken with a run, and is exactly the same as the second method. Of course the run and the jump enable one to kick to a considerably greater height.

The fourth method, known as the "hitch and kick," is more difficult, but enables one to kick still higher. A run is taken, and the take-off is usually from the foot with which one naturally jumps, the opposite leg being swung up toward the tambourine with a long, hard sweep. The arms are used to assist the body in getting into the air. After the leap the jumping foot is swung up as hard as possible to kick the tambourine, and the first foot is brought back with a motion like that of a pair of scissors. The landing is made on the foot that first leaves the ground. Care should be exercised at first, as a beginner may use too much strength and kick himself out of balance, and possibly land on his back instead of on his feet. This kick requires practice, but will bring better results than the other three.

XV

A MODERN PENTATHLON

1. FOR BOYS

A PENTATHLON consists of five different contests of such a nature as requires a knowledge of exercises that bring into action the different groups of muscles, and also necessitates some prowess.

The object of a pentathlon is to make the child's early athletic training an "all-around" affair and not an affair of "special events." The teacher of boys or girls can with a little experience lay out a series of events that will be appropriate to the age and ability of his classes. For the more advanced and ambitious it will be of value in maintaining interest in more than one line of work. The following list is merely a suggestion.

Short running race, the distance to be not more than three hundred feet.

Shot-put.

Broad jump.

Potato-race, the number of potatoes not to exceed four not more than two yards apart.

High jump.

All contestants start in the foot-race. The twelve boys who are able to make the fastest time are then allowed to compete in the shot-put. The nine boys who succeed in putting the shot the greatest distance are permitted to enter the broad jump. This event should be planned so as to leave six boys to enter the potato-race. The first three boys in this race are then qualified to enter the high jump.

The winner is to be the "pentathlon champion." As in the Grecian games, he may be crowned with a wreath of leaves, or some ceremony appropriate to the occasion may be devised.

Such a series of events will occupy about an hour's time, will not tire the boys, and will be a valuable incentive to other athletic work.

If the elimination method is not desirable, try the following. Count the first place as one point, the second as two, the third as three, etc. The final prize is to be given to the boy with the smallest number of points. By this plan each boy must exert himself to the highest degree.

2. A PENTATHLON FOR GIRLS

As in the pentathlon for boys, five exercises may be used for the girls, and the method of procedure is identical with that previously described, the following being the events:

Three-legged race for a distance not more than two hundred feet. All start in this event, which may be run in sections.

The first twelve girls are then to compete in the running broad jump.

The nine girls who succeed in jumping the farthest are then allowed to enter in the competition for throwing the baseball for distance.

The six girls winning in this event are entitled to run in the running race, of not more than three hundred feet.

The first three girls enter for the high jump.

The girl who succeeds in winning the first place is to be crowned as the pentathlon champion.

These contests may be held once a month, and the list of events changed in order to keep all interested as well as to give them the full advantage of an all-around development.

XVI

ATHLETIC STANDARDS FOR BOYS AND GIRLS

THE following standards will be found most useful by the instructor. They are obtained by taking the average of thousands of public-school records, made by boys and girls of varying weights ("eighty-pound class," "one-hundred pound class," etc.). By means of these tables, the instructor will be able to see what may fairly be expected of his pupils. The standards will be held up before them as goals for their attainment. You will not push them beyond the easy limits of their physical powers, but you will seek to develop them till they have reached — or surpassed, in exceptional cases — these standards. They will furnish an incentive which will make these exercises a sport and not a drudgery. One warning, however, should be heeded: use extreme care in presenting these standards to the weaker pupils. It is always best to enlist in this work some wise physician, who will examine the children, point out the physical needs of each, and



FIG. 13. THE FINISH OF A SPRINT

Showing the lanes in which the men run. Note how the arms are thrown up in order to let the chest break the tape.

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designate those who, for various reasons, must exercise great moderation and care in this physical training.

INDOOR ATHLETIC RECORDS FOR BOYS

50-yard dash	Elementary school.
	80-pound class . . $6\frac{4}{5}$ seconds.
	85-pound class . . $6\frac{2}{5}$ seconds.
	Senior high . . 6 seconds.
60-yard dash	Elementary school.
	95-pound class . $7\frac{3}{5}$ seconds.
	100-pound class . $7\frac{2}{5}$ seconds.
70-yard dash	Elementary school.
	115-pound class . . $8\frac{1}{5}$ seconds.
100-yard dash	Elementary school.
	Unlimited weight . . 11 seconds.
	Junior high . . $10\frac{4}{5}$ seconds.
	Senior high . . $10\frac{2}{5}$ seconds.
220-yard dash	Elementary school.
	Unlimited weight . . $26\frac{1}{5}$ seconds.
	Junior high . . $24\frac{3}{5}$ seconds.
	Senior high . . $24\frac{1}{5}$ seconds.
440-yard run	Senior high.
	$53\frac{3}{5}$ seconds.
880-yard run	Senior high.
	2 minutes, $6\frac{3}{5}$ seconds.
One-mile run	Senior high.
	4 minutes, $47\frac{1}{5}$ seconds.

- 360-yard relay . . . Four boys, elementary school.
 80-pound class . . $47\frac{3}{8}$ seconds.
 85-pound class . . $46\frac{1}{8}$ seconds.
- 440-yard relay . . . Elementary school.
 95-pound class . . 55 seconds.
 100-pound class . . $55\frac{1}{8}$ seconds.
 115-pound class . . $53\frac{3}{8}$ seconds.
 High school.
 100-pound class . . $52\frac{3}{8}$ seconds.
- 880-yard relay . . . Elementary school.
 Unlimited weight . . 1 minute, $47\frac{3}{8}$ seconds.
 High school.
 120-pound class . . 1 minute, $41\frac{3}{8}$ seconds.
- One-mile relay . . . Senior high.
 3 minutes, 35 seconds.

OUTDOOR ATHLETIC RECORDS FOR BOYS

- 50-yard dash: 80-pound class . . $6\frac{3}{8}$ seconds.
 85-pound class . . $6\frac{3}{8}$ seconds.
- 60-yard dash: 95-pound class . . 7 seconds.
 100-pound class . . 7 seconds.
- 70-yard dash: 115-pound class . . 8 seconds.
- 100-yard dash: Elementary school . . 11 seconds (unlimited weight).
 Junior high . . $10\frac{3}{8}$ seconds.
 Senior high . . $10\frac{3}{8}$ seconds.

- 220-yard dash: Elementary school . . 25 seconds (unlimited weight).
Junior high . . $23\frac{3}{5}$ seconds.
Senior high . . $22\frac{4}{5}$ seconds.
- 440-yard run: Senior high . . $52\frac{3}{8}$ seconds.
- 880-yard run: Senior high . . 2 minutes, $4\frac{4}{5}$ seconds.
- One-mile run: Senior high . . 4 minutes, $40\frac{3}{8}$ seconds.
- 360-yard relay: Four boys, 80-pound class . . $44\frac{4}{5}$ seconds.
85-pound class . . $45\frac{2}{5}$ seconds.
- 440-yard relay: Four boys, elementary school.
95-pound class . . $52\frac{3}{8}$ seconds.
100-pound class . . $54\frac{3}{8}$ seconds.
115-pound class . . $50\frac{3}{8}$ seconds.
Senior high.
100-pound class . . 51 seconds.
- 880-yard relay: Four boys, elementary school.
115-pound class . . 1 minute, 48 seconds.
Unlimited weight . . 1 minute, 41 seconds.
Senior high.
120-pound class . . 1 minute, $38\frac{3}{8}$ seconds.
- One-mile relay: Senior high.
Unlimited weight . . 3 minutes, $33\frac{3}{8}$ seconds.
- Cross-country running: High school, distance $3\frac{1}{2}$ miles . .
18 minutes, $33\frac{3}{8}$ seconds.
- High jump (running) . . Elementary school.
80-pound class . . 4 feet, 6 inches.
85-pound class . . 4 feet, 8 inches.
95-pound class . . 4 feet, $11\frac{1}{2}$ inches.
100-pound class . . 4 feet, 10 inches.

115-pound class . . 4 feet, 9 inches.

Heavy-weight . . 5 feet, $2\frac{1}{2}$ inches.

Senior high . . 5 feet, 9 inches.

Broad jump (running) . . Elementary school.

80-pound class . . 17 feet.

85-pound class . . 15 feet, $3\frac{1}{4}$ inches.

95-pound class . . 16 feet, $11\frac{1}{2}$ inches.

100-pound class . . 16 feet, 11 inches.

115-pound class . . 18 feet, $8\frac{1}{4}$ inches.

Senior high . . 21 feet, 2 inches.

Putting 8-pound shot . . Elementary school.

115-pound class . . 40 feet, 4 inches.

Putting 12-pound shot . . Elementary school, heavy-weight
class.

39 feet, $7\frac{1}{2}$ inches.

Senior high . . 49 feet, $4\frac{3}{4}$ inches.

Throwing the discus . . Senior high . . 130 feet, 3 inches.

Pole-vault . . Senior high . . 10 feet, 9 inches.

INDOOR ATHLETIC RECORDS

Putting 12-pound shot . . Elementary school.

Unlimited class . . 37 feet, $\frac{1}{2}$ inch.

Senior high . . 48 feet, 3 inches.

Running high jump . . Elementary school.

80-pound class . . 4 feet, 4 inches.

85-pound class . . 4 feet, $5\frac{1}{2}$ inches.

95-pound class . . 4 feet, 7 inches.

100-pound class . . 4 feet, $8\frac{3}{4}$ inches.

Unlimited . . 5 feet, $2\frac{3}{4}$ inches.

Senior high . . 5 feet, $8\frac{3}{4}$ inches.

Standing broad jump . . Elementary school.

80-pound class . . 8 feet, $1\frac{1}{2}$ inches.

85-pound class . . 8 feet, 4 inches.

95-pound class . . 8 feet, 3 inches.

100-pound class . . 8 feet, $10\frac{1}{2}$ inches.

115-pound class . . 9 feet, $\frac{1}{4}$ inch.

ATHLETIC RECORDS FOR GIRLS

Few authentic records for girls in athletic events exist. Those that I have marked with an asterisk in the following list are furnished by Dr. G. W. Crompton, of the New York public-school system, and are the records made by the Curtis High School. Those not marked are what would be considered unusually good performances for the ordinary girl, and can doubtless be bettered in many instances without fear of injury or strain.

20-yard dash.

60 pounds and under $3\frac{2}{3}$ seconds.

80 pounds and under $3\frac{1}{2}$ seconds.

100 pounds and under 3 seconds.

Unlimited 3 seconds.

40-yard dash.

60 pounds and under $7\frac{1}{2}$ seconds.

80 pounds and under $6\frac{3}{8}$ seconds.

100 pounds and under $6\frac{1}{8}$ seconds.

Unlimited 6 seconds.

50-yard dash.

60 pounds and under	8 $\frac{3}{8}$ seconds.
80 pounds and under	7 $\frac{3}{8}$ seconds.
100 pounds and under	7 $\frac{1}{2}$ seconds.
Unlimited	7 seconds.*

75-yard dash.

80 pounds and under	10 $\frac{3}{8}$ seconds.
100 pounds and under	10 seconds.
Unlimited	9 $\frac{3}{8}$ seconds.

100-yard dash.

100 pounds and under	14 seconds.
Unlimited	12 $\frac{1}{8}$ seconds.*

30-yard hurdles.

100 pounds and under	6 seconds.
Unlimited	5 $\frac{1}{8}$ seconds.

100-yard hurdles.

Unlimited	15 seconds.*
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400-yard relay.

Unlimited (four girls, each runs 100 yards)	53 $\frac{1}{8}$ seconds.
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Potato race. 5 potatoes, 3 yards apart.

60 pounds and under	20 seconds.
80 pounds and under	18 $\frac{1}{2}$ seconds.
100 pounds and under	17 seconds.
Unlimited	16 seconds.

Standing broad jump.

60 pounds and under	4 feet, 6 inches.
80 pounds and under	5 feet, 4 inches.
100 pounds and under	6 feet.
Unlimited	7 feet, 4 inches.*

Running broad jump.

60 pounds and under	8 feet, 6 inches.
80 pounds and under	11 feet.
100 pounds and under	13 feet, 8 inches.
Unlimited	15 feet, 10 inches.*

Running high jump.

60 pounds and under	3 feet.
80 pounds and under	3 feet, 6 inches.
100 pounds and under	4 feet.
Unlimited	4 feet, 6 inches.*

Hop, step, and jump.

60 pounds and under	17 feet, 2 inches.
80 pounds and under	20 feet, 8 inches.
100 pounds and under	24 feet, 2 inches.
Unlimited	28 feet, 9 inches.*

Throwing baseball.

Unlimited	140 feet, 4 inches.*
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Throwing basketball.

Unlimited	59 feet.*
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Fence-vault.

Unlimited	4 feet.*
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Shot-put (6 pounds).

100 pounds and under	20 feet.
Unlimited	30 feet.

XVII

HYGIENE

No teacher of gymnastics will meet the responsibilities that rest upon him if he feels that he has done the whole thing and the right thing when he has merely taught exercises to classes or individuals, or has supervised their activities on the playground and athletic field. The weakest part of our system of physical development lies right here. Gymnastics and athletics *per se* will never produce a sound body; they are excellent so far as they go, but they do not go the whole distance. We must know something of hygiene, or, to use a better term, "right living."

The strongest athlete in the world will die of typhoid fever, will suffer with the grippe, will be weakened by the ravages of the little germs of tuberculosis. He will be attacked by bacteria from a soiled towel as quickly as the weakling. True, his splendid body may more easily ward off the dangerous attacks of the millions of small enemies that seize upon him; but he will, nevertheless, be compelled to make a strong fight; and this effort will weaken him to some extent or

cause him to waste energy in meeting the onslaught of these microscopic armies.

Do these small germs really do much mischief? Listen to the words of a medical man who has had unusual opportunities to study the causes of death and sickness. He says:

"Preventable disease and accidents destroy every day American lives equal in number to the crews of two battleships, equal in three months to more than the total combined numbers of the army and navy of the United States, equal in one year to more than the total number of lives lost in all our wars since the Declaration of Independence. Everybody has been shocked beyond measure by the loss of life in the recent Titanic disaster; yet in the loss of life due to preventable causes we have in this country every day in the year a destruction of our citizens exceeding in magnitude that which occurred when the Titanic sank. Think of it: a Titanic disaster a day; and yet the public does not rise up and demand in a spirit of anger and determination that steps be taken at once to put an end to this appalling waste of human life."

The reader may say, "This is interesting, but I fail to see how it applies to me personally."

What are you doing for your pupils? Why are you teaching gymnastics? Is not health the goal for which you strive, and by striving make your own livelihood? You will never get on

less well if you give instruction to your pupils in the simple elements of hygiene, and certainly your boys and girls will improve more rapidly if they are taught to care for the eyes, teeth, nose, skin, throat, ears; to bathe, to keep clean, to avoid sources of disease (as by the use of soiled towels), to breathe pure air, and to rest, especially before and after meals.

If you are really interested in the progress of those who come to you to be made strong, well, and happy, you must talk to them about these things, also about the care of the sensitive railroads over which all sensations go to the brain. Education and development are the results of the impressions that quickly journey over these rails which we call nerves, especially those of the five senses. If they are in good condition, healthy, hygienic, the impulse goes easily and quickly, and leaves its impress upon the delicate blackboard of the brain, an impress that is never erased; but, if the nerve tracks are inflamed, sore, or filled with germs, then the trip of the sensation is blocked, and the final impression is weakened, and is less likely to be permanent.

No one will deny that we can do better work with good implements than with poor ones, and this is true of the tools with which the mind and the body work. The nerves are the most important instruments in the world, and the most sensitive.

The great and unnecessary loss of life in this country by diseases and sickness that are preventable will be reduced noticeably if the boys and girls are taught to take care of themselves, to be hygienic in their daily lives, to be clean.

The teacher of gymnastics exerts an impressive influence over his pupils. If he will teach the gospel of prevention, he will be a most influential factor in reducing the percentage of deaths, sickness, and financial waste. It costs less to keep well than to cure sickness. Dr. Rosenau of the Harvard Medical School has said that, if we saw a child drowning, we would save it, and perhaps get a medal for bravery; certainly the hero would be greatly honored; but, if we saw a child killing itself by drinking milk that was filled with germs, we should not be so interested in the case, nor would the world applaud any one for preventing such sickness or death by sterilizing the milk. There is nothing dramatic about the prevention of sickness, but much in the saving after the germs have developed; and the unappeasable hunger of the human mind is for the dramatic.

We give below a few tabloid rules for right living.

SORE EYES. — Germs of a certain kind grow rapidly on the mucous membranes of the eyelids. Granular lids, trachoma, conjunctivitis, and cer-

tain varieties of pus formations are caused by bacilli. If there is any indication of sore eyes, keep the patient away from school. Do not permit others to use the wash-basin, towels, or clothing that the child with sore eyes touches. Do not use a common towel at all, nor the wash-basin unless it is cleansed. Flies, the finger-tips, soiled clothing, carry disease. If the pupil will insist upon rubbing the eyes, let him do it with his elbow; that is the safest way.

A simple and effective eye-wash is made of camphor, boracic acid, and distilled water; it is known as the boracic eye-wash, and is quickly made up by the druggist, who has the formula. The eye-dropper and eye-cup are recommended.

THE EARS. — The ears should be examined frequently; should be kept clean, and free from wax accumulations. When cleaning the ears the boy should acquire the habit of removing the wax, not pushing it back into the ear-canal. If the ear "runs," it should receive immediate attention, because there is danger of injury to the hearing. Germs often work their way into the middle ear, causing much distress and at times serious danger. Cleanliness is imperative.

NOSE. — The rules for cleanliness should be emphasized in the case of the child who is care-

less about keeping the passages of the nose free from obstruction. A cold is due to a specific germ that thrives in the mucous membrane of the nostril. A running nose should receive speedy attention, and the affected boy should be kept from others so far as possible.

The proper use of the handkerchief is a matter well worth teaching to the young. Catarrh of a very disagreeable form may result from failure to attend to the hygienic treatment of the olfactory passages.

MOUTH AND TEETH. — So much interest is now being shown in the care of the mouth and teeth that special meetings of dental experts are called to consider the effects of bad teeth upon the health of school children, and only recently there was a large gathering of men and women in New York City to consider how to teach parents and children to care for their teeth. There are many booklets written upon this subject, and the proceedings of the meetings are easily obtainable. This material should be in the hands of every teacher. Perhaps the first rule to make is that the teacher himself should have good teeth, and know how to care for them; then he can more effectively teach others.

Brush the teeth twice daily, in the morning and before retiring. In addition to using a brush, break in two a wooden toothpick, and go care-

fully over each tooth with the rough edge of the broken piece. If there are cavities, decayed spots, or sore gums, the child should be sent to a dental clinic. If there are no clinics, he should consult a local dentist.

It is now believed that a number of common diseases that annoy both young and old may be traced to the poisonous germs that dwell in large colonies in the decayed portions of the teeth.

There are instances where bad teeth have been found to be the cause of low standing in studies, while all will agree that a child suffering pain from aching teeth cannot study or learn well.

BATHS AND THE SKIN.—Cleanliness is the remedy *par excellence* for many ailments. The child should early be taught the great importance of bathing. The shower-bath is preferable, but the tub-bath is of course good. The stimulation of the water falling from a shower-bath upon the body is desirable. After a bath the skin should be rubbed with a rough towel to stimulate the cutaneous and superficial circulation of the blood. If a cold bath seems to be non-productive of healthy reactions, do not force it upon the child. Try a warm bath, but not hot. Gradually reduce the temperature until it is within safe limits, but do not chill the child.

Teach the child to rub the skin with the hands, as this form of massage will help to make the

skin clear and healthy, and will facilitate the normal action of the cutaneous glands.

FRESH AIR. — Man may live without food for several weeks, without water for several days, but he cannot live without air for several minutes. Of all foods, air is the most important; it is the most common, and it is absolutely free.

The laws of ventilation are simple and easily learned. The boy should be taught to breathe deeply and to inhale air that is liberally supplied with oxygen. The percentage of carbon dioxide should be kept as low as possible. See that the rooms in which the youth plays, studies, sleeps, or lives are sufficiently well ventilated to keep the percentages of gases normal. Open the windows at night, and during the day if the room becomes "warm and stuffy." Use judgment in cold weather; do not chill the pupils. Cold air is not always healthy; warm air is not always undesirable; but a high percentage of moisture combined with warm air is unhealthy. If possible, agitate the air in the gymnasium by electric fans. Night air is not unhealthy.

SIMPLE, CONDENSED HYGIENIC RULES

Keep sick and diseased persons away from the healthy ones.

Take care of all wounds or cuts, as germs enter the body through such openings.

Keep the nose, mouth, and ears clean, because bacteria gain access to the blood through these channels.

Protect the body from the bites of all animals and insects.

The skin is an effective armor against germs; consequently take good care of the skin.

Dirt is a most prolific source of disease germs.

Fourth-of-July accidents, rusty nails, bites by animals, soiled finger-nails, may be the causes of severe sickness and even death.

When coughing, use a handkerchief.

Don't expectorate in public places.

Don't breathe in the faces of other persons.

Coughing, sneezing, laughing, explosive talking, often send droplets of saliva several feet through the air. If one suffers from a cold, sore throat, affected lungs, or bad teeth, he will thus scatter poison, and cause others to become infected.

Promiscuous kissing is unhealthy.

Keep out of your mouth the pencils that others use; keep your fingers out of your mouth. Don't "swap" gum.

Don't drink from a public cup.

Many harmful germs are found in dust. A vacuum cleaner is better for removing dust than a feather duster or broom. A cloth slightly oiled is better than a feather duster.

Rest, food, sleep, fresh air, elimination of poisons from the body, are important factors in the treatment of disease.

Fatigue and worry are responsible for much sickness. They weaken the body.

A healthy body is the strongest bulwark against disease caused by germs; therefore keep the body healthy.

Disagreeable emotions interfere with the functions of the alimentary canal. Anger, jealousy, and bitter thoughts are unhealthy.

Kill the fly and the mosquito whenever it is possible, as they carry deadly germs in their bodies and infect human beings when they bite. Malaria is spread only by the mosquito. Yellow fever is contracted from the mosquito.

One of the best ways to prevent sickness is so to educate the young that they will still further spread the gospel of hygiene, or when older they will vote for men who will enforce the laws of health and sanitation.

Boracic acid is a very effective antiseptic powder; it is cheap and safe.

Carbolated vaseline may be used with safety.

Dioxogen is a safe liquid to apply to sores and abrasions.

Ritchie's "Primer of Sanitation" is very helpful.

XVIII

FIRST AID TO THE INJURED

CONDENSED RULES

THE subject of first aid to the injured has become so comprehensive that it covers many cases not met with in the gymnasium or upon the playgrounds and athletic fields. There are, however, certain accidents and injuries which we must always anticipate when young people exercise or compete either in gymnastics or athletics.

These are principally strains, breaks, contusions, shocks, fainting, "pulled muscles," tears, skin-infections, dislocations, drowning, and the spread of infection by the use of towels, soiled clothing, and personal contact.

We will briefly treat each class of injuries mentioned.

BROKEN BONES. — A bone may be broken completely in two, or it may be only partially fractured; the second case is sometimes referred to as a "green-stick" fracture, and more often occurs among young people.

If the fracture is complete, the limb is shorter than before, and a hard lump may be felt at the break. The raising of the limb causes pain; the two ends may grate against each other, producing what is known as "crepitus"; there may be an abnormal angle or bend at the point of separation of the ends of the bone; or it may be that the one injured cannot even raise the arm or leg or move the part; at times the jagged ends of the bone cut through the soft tissues and even the skin.

Unless the physical director is a trained physician it is better to send at once for a doctor, and in the meantime see that the parts are rested and protected. To obviate grinding of the broken parts and further laceration they may be held quite firmly by an improvised splint made of two pieces of stiff cardboard, cigar-box boards, shingles, or even two wands. Place pieces of cardboard on each side of the break, the arm having been previously wrapped with bandages, cotton, or some soft material, and with roller bandages or adhesive plaster bind them together as seen in the illustration. If the collar-bone, rib, or shoulder is broken, a splint is applied with



FIG. 34. A SPLINT

more difficulty, but all motion must be eliminated. This can be done by the use of bandages or adhesive plaster.

Absolute rest is to be obtained until the doctor comes. In case of fainting or shock adopt the treatment recommended under the special headings. (See "Fainting, Shock.")

DISLOCATIONS. — It is at times difficult to distinguish between a break and a dislocation, particularly when the injury is hidden by large muscles or accumulation of fat. By dislocation we mean the pulling or slipping apart of the ends of the bones, the heads of the bones slipping from their sockets. Such a change in the position will at once produce an increase in the size of the joint, or a very marked depression on one side and a swelling on the other side of the articulation. In a dislocation the freedom of motion is greatly restricted.

The bones at the shoulder, elbow, and knee may be displaced; but, as these are very complicated joints, such injuries are much more difficult to treat or cure. One who is familiar with anatomy may with care reduce the dislocation, that is, set the bones back in place. If not acquainted with the anatomical geography of the body, do not try to bring the bones into juxtaposition, but at once send for the doctor. The swelling that follows a dislocation is often rapid,

the pain severe, and any delay in treatment hinders the progress of the physician, and adds greatly to the suffering of the patient when the dislocation is finally reduced.

If the teacher is competent and successfully brings the bones back to their normal position, then the parts should be "shocked" by applications of hot and cold water. (See "Shocking.") The swelling should be gently massaged, and then the joint bound with a roller bandage, but not too tightly. Rest is to be insisted upon.

Baking and vibration greatly assist the recovery of the dislocation. (See "Baking" and "Vibration.")

A SPRAIN OR A STRAIN. — A sprain is the overstretching of the ligaments which hold the ends of bones together. Dislocation is not always the result of a sprain, but sprains will always be found in dislocations.

A strain is a mild form of sprain. Both are treated alike.

The cause is some rapid, jerky movement, a fall, or a blow. The immediate symptoms are soreness, pain, swelling, discoloration, and difficulty of motion. At times it is not easy to differentiate between a sprain and a dislocation; but, if there is freedom of motion, even though painful, and no crepitus is noticeable, the injury is likely to be a sprain.

The treatment is absolute rest, shock by hot and cold water, and gentle massage towards the heart. (See "Massage.") Raise the affected parts to prevent the gravity fall of the blood. Bind with soft bandages, but do not aggravate the pain by tight binding. Use a good liniment. (See "Liniment.") Walk with a crutch or cane; keep the affected parts off the ground; do not use them for several days. Remember that a sprain at any joint where three bones are articulated is likely to be serious, and must be carefully and thoroughly treated. The shoulder, knee, elbow, ankle, and wrist come under this class. Baking, vibration, and electricity are helpful.

PULLED MUSCLES. — This name is given to the condition produced by the tearing apart of the fibres or fibrillæ of any muscle. It may be likened to the parting of the small yarns in a rope.

The symptoms are a sudden, sharp pain, as if one had been struck violently with some hard object; quick swelling, discoloration, and great distress when the parts are moved. It is not usually serious, because the muscles are richly supplied with blood and lymph, and cure quickly, while the tendons and ligaments are not copiously supplied with the fluid tissues; hence their whiteness and their tardiness in responding to treatment. Muscles are red because of the color of

the blood. These facts should be remembered when treating muscles or tendons.

The cure is practically the same as that given for sprains. Very speedy and effective results are obtained by both baking and vibration. Massage is excellent; rest is imperative. Apply the liniment mentioned later in this chapter.

There are instances where the tendons are "pulled." This is a serious accident, requiring a long time for recovery. In some cases the tendons never fully regain their original strength and reaction. This is quite true with those cases of sprain or "pulling" of the shoulder ligaments and tendons.

TEARS. — Frequently the skin on the hands is badly torn when a pupil works on the horizontal bar. We cannot too strongly urge careful treatment of such apparently unimportant accidents. The exposed surfaces should be cleaned with surgeon's soap and treated with boracic acid. A thin covering of absorbent cotton will be laid on, held in place by slender strips of adhesive plaster; or the edges of the cotton may be held down by collodion. Some objection is often made to covering a sore with collodion and cotton, but in these cases there is no danger. Do not permit the pupil to use the hand for a couple of days, and then the bar should be carefully

cleaned. Deep abscesses have resulted from carelessness in the treatment of such tears.

For general cuts use a like treatment, but in case of the suspected presence of pus do not make the covering air-tight, as with collodion.

BLEEDING. — There are two kinds of bleeding: that from veins, and that from arteries. The former shows a dark-colored blood; the latter, a bright red blood. The flow from the vein is steady and oozing; that from arteries, gushing and spurting, the pulsation being synchronous with the action of the heart.



FIG. 35. A
TOURNIQUET

In the case of venous bleeding put the pressure between the cut and the extremity. If it is arterial bleeding, put the tourniquet between the heart and the cut.

A tourniquet is any kind of instrument that may be used to exert hard pressure upon a vein or artery. The simplest is made with a handkerchief. Tie the ends together, thus forming a ring; place this above or below the cut as the case demands. Let the knot rest over the blood-conduit, and then insert a short stick in the cloth ring thus made and twist it until the knot sinks into the soft flesh, shutting off the flow of blood. (See Fig. 35)

If the loss of blood is excessive, or the treatment does not soon cause the flow to cease, send for a doctor. Venous bleeding is not so dangerous, as clotting tends to shut off the escape of blood; but in the case of a severed artery the end nearer the heart will have to be ligated, tied up, or the end of the conduit twisted until it is completely closed.

DROWNING. — As part of the equipment of the modern department of physical education consists of a swimming-pool, there is always some danger of drowning. The treatment of this accident is really simple. If a person wishes to empty a glass filled with water, he turns it upside down and pours the water out. If the lungs become filled with water, we follow precisely the same plan, and tip the drowning person upside down. It may be that the tongue stops the passage from the lungs to the mouth; therefore the tongue must be pulled down. Do not be afraid of hurting the patient; he is unconscious, and nothing must interfere with his possible resuscitation.

If the patient is too heavy to be thus lifted up, he should be placed face down on a barrel or some like object. If the barrel is not at once procurable, then let a man bend down and rest on his hands, elbows, and knees, and take its place. By using the barrel the drowning man

is so placed that the head and mouth are lower than the lungs, and the water will run out of the lungs, especially if the body is rolled back and forth.

As soon as the water is expelled, or as much as possible, then resort to what is called "artificial respiration." Raise the ribs as high as possible by lifting up the arms far above the head. This act produces a vacuum in the lungs, and the pure, oxygenized air will rush in. Next force the arms down hard upon the chest to press the ribs in, thus expelling the air. By repeating the movements for some time natural respiration may be induced, and the patient will very likely recover. Keep the body warm by sufficient covering and by warm drinks — milk or coffee.

If the patient does not respond to the above simple treatment, get oxygen, if possible, and feed this to the lungs.

By all means send for a physician if one is near, and also ask for an oxygen-cylinder.

SKIN-INFECTIONS. — In every gymnasium there will be a few pupils who are careless about their personal condition, who do not take baths, whose home life is far from being hygienic, and who are troubled with common forms of skin-disease which may be given to other pupils that are in every way clean and hygienic. It is not neces-

sary to mention the technical names of all of these diseases, but to insist upon the adoption of every possible method to prevent a general infection.

Ringworm, impetigo contagiosa, and psoriasis are the most common forms of skin-disease met with in the gymnasium. They are easily spread by personal contact, by towels, suits, and by mats.

The finger-nails are very prolific carriers of these diseases. Pupils must be taught not to scratch a sore and then touch any other portion of the body with the finger-nails.

Send any case, actual or suspected, to the physician. Segregate those infected; keep them away from the building; and under no circumstances permit them to use towels that others may use.

BAKING. — The prolonged application of heat to sprains, dislocations, swellings, muscle soreness, etc., is becoming more and more popular.

It has long been known that a temporary warm or hot application was alleviative, but the use of an oven in which to "bake" the injury is of comparatively recent origin. Bakers are to be found in nearly every modern gymnasium. Athletes, trainers, and laymen are enthusiastic over the good results that come from baking an arm or leg, or even the whole body — for some of these ovens are more than six feet long.

The temperature varies from 300° to 400° F.; the time of baking, from fifteen minutes to an hour. The portions of the body baked are covered with cotton or towels before being placed in the oven.

VIBRATION. — This is a form of massage that is very effective. Every teacher should have in his emergency outfit a first-class vibrator. A poor motor is expensive at any price, and will not last.

The great variety of movements and the ability to control the pressure, together with the very high rate of speed of the rubber attachment, add to the worth of the device. In any case where it is necessary to stimulate the circulation of the fluid tissues of the body the vibrator is indicated. Sprains, bruises, contusions, swellings, etc., are helped by the mild but rapid beats of the soft rubber hammers.

MASSAGE. — This is the earliest and most natural form of palliative treatment. When any part of the body hurts, we rub it. If there is a cinder in the eye, we, unwisely, massage the eyelids. If there is a scratch or pain, the hand goes there. Headache is often relieved by manipulation.

These movements are now classified under the general heading massage; the special movements

are called kneading, hacking, cupping, percussing, shaving, whip-lash slapping, stroking, etc. They are all helpful, but certain injuries or conditions demand more cautious methods of manipulation than others.

The teacher should know something of superficial and deep kneading, of the slapping, percussing, and stroking movements. If there is no vibrator, he should learn to make the tremolo, shaking movements. A moderate amount of practice in massage will enable the teacher to assist nature wonderfully in making a cure.

LINIMENT. — One of the world's greatest athletic trainers, a man with an international reputation, Mr. Michael Murphy of Yale and Pennsylvania universities, better known by the less dignified sobriquet of "Mike" Murphy, for years used a special liniment for massaging or "rubbing down" his athletes. In case of muscle soreness, bruises, contusions, pulled muscles or tendons, he applied the same liniment. The ingredients are as follows:

Arnica	ten drops
Alcohol	six ounces
Witch-hazel	two ounces
Oil of wintergreen	ten drops

Mix and shake well before using. Another lotion is a mixture of camphor and alcohol. Any

druggist will put up either of these preparations.

The slight oily residue left on the skin after rubbing may be removed with soft cloths.

“SHOCKING.” — This is a term used to indicate a simple method of reducing swellings and relieving pain. It consists of placing the affected part under a stream of cold water for three minutes, and then immediately changing to a stream of hot water, where it is permitted to remain for an equally long time. Repeat these changes four or five times.

If it happens that there are no hot-water and cold-water faucets close by, then wrap the part in a heavy towel saturated with ice-water, and after three minutes apply another towel that has been soaked in very hot water. The changes may be made every two minutes if necessary.

The theory of this treatment is that it greatly stimulates the circulation of the fluid tissues. Repair, growth, or normalizing of swollen parts of the body depends upon the circulation of the blood and lymph. The application of hot and cold water is a speedy and safe excitant. Vibration and massage act in a similar manner.

FAINTING, SHOCK. — If one faints from any cause, loosen the clothing about the neck and chest, open windows, and supply fresh air, keep